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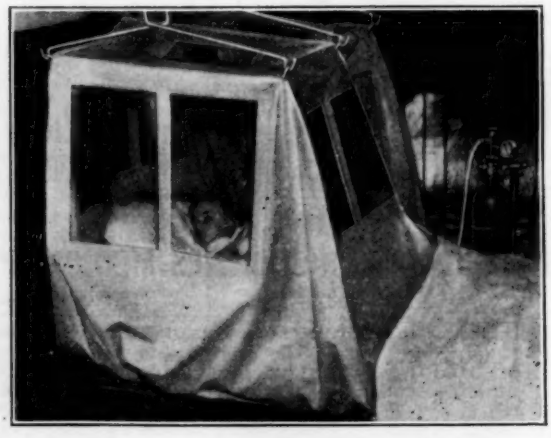

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ADDRESSES AND ORIGINAL ARTICLES

CLINICAL SCIENCE WITHIN THE UNIVERSITY *

BY SIR THOMAS LEWIS, C.B.E., M.D., F.R.C.P. Lond., F.R.S.

PHYSICIAN IN CHARGE OF THE DEPARTMENT OF CLINICAL RESEARCH, UNIVERSITY COLLEGE HOSPITAL, LONDON

I

IN response to the invitation with which you have honoured me, I am going to plead before you to-day that the biological science in which I am interested, should be given fuller university status. It is a special privilege to be allowed to bring these views to a university closely engaged in considering problems of medical education, and in a lecture commemorating a man universally recognised as a chief pioneer both in science and in education. But though Thomas Huxley gave his brilliant mind to the search for and diffusion of knowledge in physiology, and in other branches of biological science, his interest was not directed to studies of human disease. For this reason, you will perhaps permit me to turn for a moment to his distinguished contemporary, James Paget, who, at first similarly attracted by biology, was subsequently drawn on to become a noted investigator of disease in man and a most gifted surgeon. It was the development of Paget in this direction, which enabled him, while very conversant with contemporary biological and physiological thought and fully alive to its importance, to make these deliberate and weighty statements in speaking of clinical work:

> "I feel sure that clinical science has as good a claim to the name and rights and self-subsistence of a science as any other department of biology; and that in it are the safest and best means of increasing the knowledge of diseases and their treatment. . . ."
>
> "Receiving thankfully all the help that physiology or chemistry or any other sciences more advanced than our own can give us, and pursuing all our studies with the precision and circumspection that we may best learn from them, let us still hold that, within our range of study, that alone is true which is proved clinically, and that which is clinically proved needs no other evidence."

I use these clear and memorable sentences of 65 years ago, with which I find myself thinking in such close accord to-day, to introduce the matter of the present address. In using the term "clinical science" Paget thought exclusively of researches upon living man. I shall use this same term to convey his meaning, but shall widen it; and define clinical science as the branch of knowledge that centres upon diseased human beings, but which also includes directly relevant parts of the allied sciences. The central field of work is the human patient; and this will remain the field peculiar to the science. But work will often extend to more distant boundaries; these will include human physiology, because the normal is the control to the diseased man; will include the morbid anatomy and the bacteriology of man; and will include "experimental medicine," which has come especially to mean such experiment upon the lower animals as is inspired by clinical problems.

I am putting before you the idea that clinical science *so defined*, should find its place and acquire proper status within the university. It has sometimes been pointed out that what I have spoken of as clinical science is not clinical medicine and clinical surgery as these are practised, and that certain of its activities might justly be termed physiology or pathology. I know that this is so. The distinction between the science and the art of medicine is intentional, they should be kept as separate ideas, and regarded as separate directions of human endeavour, in working to practical ends; though it is to be said that there is no wish to infer that the science and the art can never be pursued by one person. By intention too, distant boundaries have been fixed. To give independent strength to the science it must be unhampered in its movements. The boundaries between individual sciences may not be rigidly maintained without hindering progress; overlaps between clinical science, pathology, and physiology are vital to medical science as a whole; they bind together three activities, which in process of time have grown too far apart from one another. We are here engaged in discussing a serious practical question—namely, the relation of the university to branches of knowledge that concern the health of mankind. The university cannot successfully enter this field of activity without setting up within its own domain a strong scientific department inspired by direct clinical interests.

In attempting to picture clinical science within the university, the relation and attitude of the several medical sciences to each other obtrude themselves. In recent times discussion has sometimes turned from mere statements of achievement, possible and real, to a comparison of the merits of these sciences, or to a comparison of the relative importance of the contributions from ward and laboratory. These two comparisons are of course distinct, for in many of its activities clinical science is to-day essentially a laboratory science. I understand by a laboratory a place well equipped with apparatus and other facilities for working by special and quantitative methods; I cannot accept the common notion that a laboratory is a place to which animals but no patients are admitted. It is proper and necessary periodically to describe and emphasise the mass of knowledge that mankind undoubtedly derives both from the physiological laboratory, and from the clinical ward with its associated laboratories. But an attempt to assess the relative merits of these different activities swings discussion from useful into controversial channels, and simultaneously diverts attention from central truths—namely, that the merits of these various forms of work are not in fact comparable, and that both clinical science and physiology, both ward work and laboratory work, are absolutely and therefore equally essential to the attainment of those practical goals towards which all groups of workers in these fields are striving. The sciences considered form a closely interconnected series, which should be encouraged to grow as one harmonious whole. To the more applied science, any growth in the purer science that nourishes it is a gathering of its own ultimate strength; and any growth in the applied science promises to the work of the purer science a surer fruition. The welfare of each member of the series is highly important to all other members; the general strength will largely find its measure in that of the weakest component. Here therefore is the strongest motive for mutual goodwill and support. Nothing will more quickly bring the allied medical sciences

* The Huxley lecture delivered at the University of Birmingham on March 14th.

into close understanding and sympathy, which from every standpoint is so desirable, than that they should be placed upon just the same footing within our universities; it is essential to this purpose that each should be founded on the cardinal principles, which shape sciences universally, and that each should possess scope sufficing to give independent strength.

II

It is necessary to my main theme to show that clinical science has the power to contribute abundantly to progress, and this leads me on to speak briefly of the broad relations of this science to problems of human disease. Studies of disease cannot begin until disease is recognised and in some measure understood; real knowledge of disease is derived only from disease itself, it is not built up in the form of concepts of perverted function. No human disease is known to be curable until man has been cured of it. It is in the very nature of things that, in its initiation and in its culmination, work relating to human disease must be done on man himself. Once the problem has been formulated, and before the final work on man is done, in a middle phase, study may become diverted to the lower animals. Such work, provided that it still concentrates upon the problem of disease, is still within the province of clinical science, as this has been defined, though, be it granted, it would fall without under a narrower definition. But under one or other definition the facts here briefly stated bring us to comprehend that the opportunities of clinical science in guiding and coördinating work as a whole are unique.

Notable advances in the practice of medicine and surgery come chiefly out of work concentrating upon the main problem studied in its natural environment, rather than from researches of a more remote and recondite kind. These latter are not to be placed upon one side as unimportant, or even as less important, to progress: but their influence is less immediate; they provide us with methods of precision; they suggest to us tests to employ and experiments to undertake; they help us much in explaining and appreciating the manifestations of disease and the mode of action of our remedies. But the management of disease is rarely to be deduced from first principles; it is the direct approach that attains swift success. The value of facing the problem directly has been illustrated repeatedly. When Pasteur was called to investigate fermentation in wine, the disease "pébrine" in silkworms, and the disease anthrax in sheep, he dealt with each of these problems in its stronghold; starting from the disturbance or the disease itself, he concentrated upon it and ultimately and in each case himself brilliantly won the remedy. Jenner similarly dealt with smallpox, seizing during his clinical experience of the disease upon folklore, from which he worked on and subdued a scourge; in like fashion and starting from compound fractures Lister attacked and swept away the sepsis of surgery. It is not often that the efforts of one man can achieve so much; but the same form of successful attack can be illustrated by the work of Ross upon malaria, of Mackenzie upon auricular fibrillation, and by the recent work of Laidlaw and his colleagues upon the distemper of dogs. A more involved illustration is that of the discovery of insulin and its effect in diabetes mellitus. First comes the recognition of the disease, then recondite laboratory research happens upon a new effect of excision of the pancreas, both essential steps; but the present aptness of the illustration lies in its final stages. Banting, a young doctor familiar with the malady diabetes, was inspired by learning from a clinical paper that obstruction of the duct of the pancreas leads to atrophy of the excretory parts of the gland; out of this idea he directly devised the method that first proved the presence of an internal secretion insulin in the remainder of the gland, and from this Banting and his colleagues themselves drove on to the end-point, the successful administration of insulin to patients.

These illustrations by showing how important to the result is concentrated attack upon a problem in its own environment, place clinical science and the more recondite sciences in their true perspective. I pass on to consider some ways in which clinical science works.

Scientific discovery begins with observation and it will clearly be perceived that discovery relating to disease forms no exception, but will always start from observations upon the disease. On previous occasions I have emphasised the importance of new descriptions of states of disease, and the associated attempts to define them precisely, knowing how vital is this branch of our work to progressive study of disease. Those who come into intimate contact with clinical researches are soon forced to recognise the profound influence of terms on progress, and the value of their accuracy. When we name disease, we invent terms which we realise to be abstractions. They represent abstract conceptions in precisely the same sense as do the terms, atom, cell, vitamin; and as terms they serve exactly similar purposes. A physiologist begins an analysis, he isolates what he terms carbohydrate, fat, protein; he attempts to study the origin, nature and destination of things for which these terms are supposed to stand, and as he studies, new qualities are found, he subdivides, and new names and new definitions spring up. So with our named diseases; we set out to isolate and to bring sharpness to our images of states of disease and begin to inquire what they are and whence they come. The names of diseases are not immutable. As with the physiologist, so with us, our terms change and our definitions shift as we work; such changes are inevitable and constitute the adjustments, nay a measure, of progress. Our terms stand to us for conceptions, which may be relatively vague or relatively precise, but which serve for intercommunication, and are numbered, like working hypotheses, among indispensable tools. Our definitions are beams of thought focusing in terms, and this focusing and sharpening of focus represents a high form of intellectual endeavour. But these mental activities, conveniently summarised in terms and in definitions, depend upon the close and endless work of observation and experiment, upon inquiries into the manifestations of disease and into its origin and natural history. This kind of work is little understood outside the ranks of actual workers in this field. There are the early attempts to isolate and separate states of disease in patients upon the simple basis of observation in the living. The resulting subdivision is crude and constitutes no more than a beginning. There follow the more intense refining processes; hypothetically separate states of disease are closely scrutinised, underlying morbid lesions are examined, the various manifestations of the disease are subjected to analysis, the cause of the disease is explored, and found perhaps in a change of environment or in the introduction or growth of organisms within the body. In these studies especially, knowledge and method derived from the allied sciences are used, in these studies the observational method begins to be found

inadequate and the experimental method comes into play. The studies are intricate and often highly technical and, as they proceed and the nature of the malady and its natural history are explored, ideas alter, and we begin to define and to rename. Thus, while the early names base themselves on simple observation, the later names and definitions base themselves on far more elaborate and difficult studies. The simple process of observation, from the nature of the case, soon tends to exhaust itself, but the accurate defining of states of disease does not. Here is an ever present opportunity of clinical science. The defining of states of disease, as it has been outlined, is fundamental to and inextricably interwoven with the study of these diseases; I affirm that this defining is yet in its infancy, that its primitive state is inhibiting the progress of medical science, but that as this branch of knowledge develops, our conceptions of states of disease will change profoundly.

There is more to be said about experiment; for in this direction our point of view in studying disease has begun to alter rapidly in recent years. It should be manifest that whenever we interfere with a patient, as when we employ any test of a patient's reaction to something introduced from without, to exercise, to a foodstuff, or to any other substance, or to any physical stimulus, we experiment. Experiment has long been applied in the sphere of treatment. Every remedy employed to-day is the result of experimentation on man, every new remedy we shall employ in the future, must inevitably pass through this experimental stage. The method has made three incomparable gifts to medical science and the welfare of mankind—namely, vaccination, antiseptic surgery, and general anæsthesia. Experiments judiciously selected and properly conducted are not only harmless, they are often or usually beneficial, teaching us more rationally to regard and manage the patient's condition. Those who have charge of patients are in this respect loaded with a grave responsibility; only harmless or beneficial experiments are justifiable. It must be understood that responsibility cannot be evaded by refusal to experiment; experiments always have been conducted, always will be, for they are essential to progress. It is obviously very important that such experiments as are made should be made with the consent of the patients, should be made in a safe manner, and that they should be conducted so that they give reliable answers to the questions asked. Of experiment in medicine, and especially in the examination of remedies, much that is done lacks precision and proper control; consequently, much of the work is valueless and must be repeated, and so very many more experiments are carried out than is necessary to determine the result. You will apprehend that, in so far as remedies are concerned, I am advocating a reduction in the numbers of experiments performed, and their conduction upon a much stricter, safer, and more productive basis than hitherto. But the fruitful application of the experimental method to states of disease does not end with an investigation of remedies. There are many opportunities of testing patients by harmless interferences in such ways as to explain manifestations and causes of disease. In this direction the experimental method has only begun to bring us new knowledge. That is so because, apart from the search for remedies, more purely observational methods are traditionally natural to practitioners of medicine and surgery. The experimental method requires for its employment a special outlook and training; thus those having easy access to patients use this method and its controls little; and those trained to employ it are often denied the access, which they desire. Those working in other fields are able to recognise directions in which the method has already achieved success; but only those intimately in contact with the work of clinical science perceive the manifold directions in which it remains to be applied. I will not weary you by enumerating past results, or by pointing out specific problems now requiring this method of study, but will state categorically that it is peculiarly appropriate to innumerable manifestations of disease, and to many problems of causation. This statement is true not simply of one or two types of disease, but of problems connected with almost every variety of disease; the method is of almost boundless application. Experiences of work in diverse directions, convince me that experiment is as fundamental in investigating disease in patients as it is in the case of other biological sciences, and that clinical science properly established would soon demonstrate the fact abundantly.

This general survey of the particular activities of clinical science, activities which have been considered previously on more than one occasion, will suffice to show that this science deserves very full encouragement. Briefly, the starting-point of the practical problems of medicine is the patient; it is clinical work alone which can formulate the problem and it is the clinician who is best placed to guide it to a fitting termination; but this directing of work requires wide knowledge and often intimate experience not only of clinical methods, but of the methods and facilities afforded by allied sciences. The experimental method, which I foresee must play an increasing part in future work, calls for a particular point of view acquired by long training and experience in suitable original work. The employment of intricate apparatus and intimate knowledge of tests of precision make deep inroads into reserves of energy and time. While we may still expect to see many valuable discoveries coming from men engaged in the practice of medicine and surgery, it is increasingly clear that in many directions advances would more readily come from men free to give their undivided energies and thoughts to the work of progress, to the exclusion of routine. It is for this reason that the establishment of posts of clinical research has seemed so necessary. Because men must be trained to do such work, because it is right that those professing such work should enjoy the stimulus derived from teaching and from an appropriate atmosphere, it is necessary for clinical science to become established within the walls of the university.

III

To discuss the important matter of educating medical students is not the object of this lecture; but in ascertaining the place of clinical science within the university this problem necessarily comes under review. It will be common ground, whether knowledge to be conveyed refers to practical art or to science, that education is most vigorously conducted by close contact between the student and the master of his subject; methods of work are learned from demonstration, methods of thought by conversation; communism inspires. If you would learn to do a thing, you go to one who does it well; you watch, you listen, and your own first attempts are made under supervision. The teaching of medical practice began and has continued until recent times under such a simple system of apprenticeship. The final stage of medical education in this country still rests solidly upon this traditional foundation, centring upon clinical demonstrations and upon a system of clerkships and dresserships; the high value of this method has obtained wide recognition. The most fitted to

teach practical medicine and surgery are those successfully and daily engaged in its practice. But in a simple apprenticeship system, where a doctor has but one or more pupils, the standard of teaching would vary too greatly and would be in the average too low; therefore students are brought together under teachers chosen for their unusual energy and ability. While it is obvious that the best teacher for general practice is a first-rate general practitioner, such practitioners could rarely engage actively in teaching numbers of students and yet pursue their ordinary work. For the reason that among able doctors hospital physicians and surgeons are the most readily available, teaching has fallen into their hands. This has formed for many years a more or less satisfactory compromise, though one that becomes less so in the measure that consulting work grows more specialistic in its outlook. The main principle emerging is that the final stages in the preparation for practice should be conducted by practising physicians and surgeons. Efficient medical practitioners are not scientists; the bulk of their daily work is not to create or to discover but to follow the established rules of an art; as in the case of other practical arts their work, while highly skilled and often ingenious, is nevertheless chiefly repetitive. Preliminary education in science I shall allude to later, for the moment it is the immediate preparation for practice that concerns us; of this I would say, that as it is an art, it should be taught by those who practise it; and we may be content that while such a system is basically sound, it happens also to be the most economical.

Enough has been said to enable me to bring the final stages of the education of the medical practitioner into proper perspective and to display more clearly my views of the main functions of the university in its relation to the final subjects of the medical curriculum. In thinking of the education of the practitioner, one is forced to wonder if the final stages of his preparation for practice form an appropriate activity for the university. But this question of the extent to which it is proper for universities to prepare students along technical lines is one affecting so many other forms of vocational teaching, that I shall not venture further to consider it. I shall assume for the purposes of present argument that universities will continue at least to direct vocational education. But if this assumption is a correct one it is necessary to come to two conclusions. On the one hand the university must be prepared to train, or to direct the training of, students in medicine as a practical art. On the other hand it must take heed that this vocational training does not displace, does not prevent the full development of, the purely scientific pursuits of medicine within the university.

It would seem quite unsound from the university standpoint that the training of either practitioners or consultants should be regarded as a primary or direct function of a professor of medicine or of surgery. I do not mean that it may not be his function largely to control such training; I do mean that the transference of any of that work of training medical practitioners, which has been undertaken so well in the past by practising physicians and surgeons, to the professor would be a fundamental mistake. This training is manifestly the work of practitioners; it is very definitely not the work of professors in the full university sense.

The man who is fit to train the practitioner to begin his life work must be thoroughly familiar with everything that makes for successful practice, must himself be in practice, must not only understand disease and its management in its detail, but must be competent in managing sick people and their friends; he must be familiar with the science, skilful and precise in the craft, and versatile and diplomatic in the art. But these varied accomplishments will not fit him for the professorial chair. The work of the professor as I view it, though from many points of view intimately related, is distinct from this. I ask the questions: Is medicine in its final aspects to be studied only by those engaged actively in its practice; is there to be no study of general concepts and of method, such as would be in more obvious accord with the recognised standard of university departments of science? Are we to remain content that activities of the latter kind should be pursued within the walls of the university solely in the departments of anatomy, physiology, and pathology? To answer these questions affirmatively is to deny medicine real university status; to answer them negatively is to accord that status.

To make clear what I have in mind I will attempt broadly to sketch professorial duties. The first duty of a university professor is the advancement of knowledge of his subject by research; his second duty is to encourage and to disseminate learning. These are the accepted duties of professors in scientific departments in all universities worthy of the name; there is no reason to view differently the duties of those who profess the science now under discussion. The professor should be chosen primarily for his distinction in his science, or for his promise of such distinction. I see no reason why distinction as a practising doctor should be regarded as a qualification, but many reasons against. There is no reason why the professor should not be appointed, as often are his colleagues in other scientific departments, as a young man. He should have been engaged actively in research in an appropriate field—namely, work that is actually undertaken upon patients, or laboratory work that is directly related to, and inspired by, problems arising in the ward or out-patient department. Such work he should continue, and he should supplement it by personally directing the similar activities of his pupils. His own research work will probably develop, as prolific work nearly always does, along special lines, but a broad outlook will be maintained by his contacts with the work of colleagues and assistants, and by his teaching.

His teaching should have breadth and in its outlines should be accessible to all. I have already indicated strong dissent from the idea that it should be concerned primarily with the needs of practice. It should deal chiefly with the principles of the science, and with patients only to exemplify specific points.

The professor should study and expound the history of the medical sciences and especially of clinical science, and this should be done, not from the biographical standpoint, but with the definite motive of determining the ways in which problems are solved. His business is not with the eccentricities of medieval quacks, but with the origins and development of ideas in the minds of chief contributors to medical knowledge; and here, because true and full information is more readily available, his search should relate mainly to recent rather than to remote discoveries. He will trace the growth of knowledge, and will examine the influences of those systems or schools of thought which have prevailed. All this he will do in the attempt to discover sources of knowledge, prolific and sound methods of work.

He should deal with the problem of the cause of disease, or the conditions engendering disease, in its very many aspects; his survey will cover very wide fields; he will discuss the principles of hereditary transmission as these are known to relate to human

disease, and he will inquire into the broad questions of the reaction of man to his environment; thus he will discuss on general lines such problems as the meaning and effects of infection, the significance of sexual, racial, and other predispositions to disease and the influence of one state of ill-health upon another, the reaction of human tissues to physical injuries and to simple chemical poisons, the meaning of curious susceptibilities to more complex poisons, and the manner in which new growths arise in man.

He will attempt to analyse outstanding manifestations of disease, such objective phenomena as arise out of altered metabolism, changed temperature regulation, and water-balance, and such subjective phenomena as pain, breathlessness, exhaustion, and the like. I have in mind the consideration of these and similar manifestations both upon broad lines and in detail, but always with special reference to human disease. There are innumerable matters of this kind for profitable discussion and work; they should not be relegated to the pathological laboratory or theatre, for this procedure breaks the contact with the human material, which can be used so aptly to illustrate, which inspires related laboratory problems, and itself so often constitutes the most prolific focus of inquiry.

In regard to diagnosis, prognosis, and treatment, let these be dealt with again on general lines, by the laying down of guiding principles, rather than by the systematic consideration of specific diseases. It would be well to ensure first of all that what is meant by diagnosis should be understood and to contrast it with new descriptions of states of diseases; to explore error in diagnosis and its practical significance and to emphasise the need for its complete avoidance in research that depends on diagnosis; and to compare the empirical method of diagnosis with that based on understanding. It would be well to show the proper basis upon which prognosis is built up, and to discuss the relative values of theoretical and empirical methods of procedure. It would be well to explore the ways in which new remedies are discovered; to show how the curative properties of remedies or their power to alleviate are to be ascertained; and to teach how by research the use of known remedies may be rationalised, the remedies perfected, and the field of their efficacy widened.

In all these directions the professor should strive to formulate and inculcate the principles underlying methods of work and thought in his science; he should insist upon the constant need of accuracy in observation, and of controlled experiment; he should teach the student to appreciate the value of evidence, and encourage logical forms of argument and of sequential reasoning. He should stimulate inquiry. He should display the details of his own researches and those of others, and illustrate discovery and the principles laid down, by repeating chosen observations and experiments in the form of demonstrations.

There is no branch of medical science that offers more opportunity for demonstrations, there is none which offers more occasions for the use of reasoned argument, there is none which calls for higher intellectual attainment; for there is none which combines so many forms of scientific activity, and none in which the worker is forced so closely and so frequently to consider both simple and complex problems of cause and effect. It is in his physiological studies that the medical student is first called upon to stretch those intellectual faculties, which are particularly used by scientists; for this reason physiology is rightly recognised to possess great value as a mental discipline. But this beginning does not suffice. These faculties should be stretched farther and kept under tension. Not only has clinical science the fullest competence to effect this development but, so far as medical men are concerned, it is manifestly the most appropriate branch of science in which to bring these mental faculties to their highest efficiency; for it is the branch of science with which medical men will remain in closest contact, or that in which they will actually engage, not for a few years, but for the rest of their lives.

It is not for me to present you with a syllabus, but it has been incumbent upon me to show that there is ample scope in the shape of research, lectures and demonstrations, within the field of clinical science for professorial endeavour, apart altogether from a systematic consideration of the diagnosis and treatment of diseases. These activities, supplemented by the work of guiding others and efforts to maintain firm links with the allied sciences, are enough, and with well-defined facilities can be brought to successful accomplishment.

The first requirement of a university department of clinical science is an out-patient and in-patient service, sufficient to provide ample material both for the research and teaching in the department. There is room for difference of opinion as to how large such departments should be, especially as to how many beds are necessary; this will decide itself partly by the local conditions and by the particular activities of the professor and his assistants. The first point I would make is that the cases upon which work is being done should be under the full control of the worker; experience has shown that this policy is alone practicable. Productive clinical research usually comes from an intense study of carefully selected cases, rather than from less careful studies of larger numbers; certainly this is so in all but the preliminary stages of investigation, that is to say once the problem has become defined. Consequently though large numbers of beds under the control of the worker are not required, the professor and each of his research staff must have an adequate complement. I regard the ideal arrangement as one in which the worker, while fully controlling, and having full responsibility for, all cases under investigation, is further provided with a service of patients from which he can select, and that he should be relieved from responsibility in the management of these; such relief can be given in a number of ways, as by clinical assistants drawn from those concentrating upon practical medicine, or by the close linkage between professorial and other services. Some additional beds will be required to satisfy the needs of teaching; but the total number required is definitely less than ordinarily serves a teaching unit of practical medicine or surgery. Out-patient and in-patient service should balance; and the system adopted should be adjustable so that the professor or his assistant may be free to concentrate from time to time on cases in one or other service, or upon work on lower animals.

Adequate laboratory accommodation is a second requirement, here the need in so far as space, fittings and equipment are concerned will be appropriate to the type of work, and will vary from time to time. It is important to the workers that these laboratories should be as close to the clinical services as possible, in part they may be directly attached to ward or out-patient department, sometimes it can be arranged that they will serve for the special and uninterrupted examination of either patient or animal.

IV

In considering the usual medical curriculum of to-day, and asking where in it clinical science is to play

its part, I would start from the statement that this curriculum is already overloaded. So far as the majority of medical students is concerned it is overloaded by the preliminary sciences, including anatomy, physiology, and general pathology; so far as all students are concerned it is overloaded on the clinical side in directions presently to be indicated. My personal belief, founded upon over twenty years of constant teaching of medical students, is that most medical students derive less intellectually from their preliminary work than is often supposed. But I have also become convinced that while for the more scientifically minded student very full measures of physics, chemistry, and physiology are invaluable, the final work of the hospitals, as now conducted, is far from satisfactory. It is unsafe for any man, whose training in science has started well, to accept, on an authoritative and not on an evidential basis, the mass of statement of fact and hypothesis that the final student is now called upon to accept. There is too the very grave objection that during several years out of those most important to a man's intellectual development, he is occupied in amassing disconnected information to the exclusion of contemplation. It seems beyond reasonable denial that the full course of work, supplemented as this is by purely clinical appointments, if suited to the training of a practitioner, must be unsuited to the man who is to make science a career; it is wrong that he should so long be denied the chance of engaging in, or of being at least in close contact with, original work.

I think it is agreed that there are grave defects in medical education to-day, but agreement as to the remedy would come nearer if it were recognised that the right methods of educating practitioner and scientist are not the same. Cautious exploration may be necessary. But there is the principle to guide us—namely, a measure of separate consideration for two classes of student. I suggest as a basis of discussion the following plan in broad outline, and to simplify I shall omit consideration of those sciences, which by consent form part of the basis of a general education.

There should be a first course consisting of outlines of human anatomy and physiology, both taught to ensure a clear understanding of the main mechanisms of the body and with special stress upon the needs of the final qualifying courses of instruction, that is to say, it should be particularly emphatic in teaching what is immediately applicable to the study of disease; for such matter will always command particular interest and will be the more willingly and more easily remembered. It is not suggested that this course should consist exclusively of such material, for much must also be taught solely to illustrate the principles of the sciences concerned and their methods of work.

The second course should be one of more advanced physiology, suited to a science degree and to those who intend to take up physiology, pathology, or clinical science, as a career. It should not be compulsory for medical students, it would ordinarily be taken in direct sequence to the first course, in some cases it would culminate in an honours degree, in some instances it might be delayed.

The third course should be the final or qualifying course, and it should consist on the one hand of general and practical instruction along present lines. For the qualifying examination it is necessary to demand a general standard of professional knowledge fitting the graduate to begin independent management of patients; but present-day teaching must be simplified in all its branches. What is essential to general practice should be retained and emphasised, but there should be ruthless pruning away of what is insecure, intricate or redundant, and of what belongs peculiarly to the province of specialism. Teaching should mainly concern itself with common maladies and with remedies of proved worth and ready application. There should be a determined effort to arrange facts and ideas in thoughtful sequence, and to train students to think logically as well as to observe keenly. This simplified final course should include the outlines of clinical science, and thus arranged should be the regular course for all medical students. Higher examinations should I think definitely differentiate between two classes of students. The Royal Colleges and perhaps the universities would still hold advanced examinations primarily testing professional abilities. But there is room for a university degree in medical science, which should not include medicine, surgery or other branch of medical practice as such, but should centre upon disease, as this is studied in human beings; and this degree should be intended to mark those contemplating an academic career.

V

It is my conclusion that it is largely within the power of our universities to establish the branch of work that studies disease in living people as a science, by removing the obligation to engage in and teach the practical art, and by treating clinical science on precisely the same basis as the allied sciences, physiology and pathology, are treated, thus bringing all the work into real harmony. The maintenance of equilibrium among these three may then be left with confidence to the interplay of individual and general needs, and to the mutual sympathy that is natural in any corporation of enlightened people working to a common end.

THE EVOLUTION OF MIND*

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The Mammalian Mind (*continued*)

Mammals possess the same inborn capabilities for purposeful reaction to stimuli—commonly called instinct—as those possessed by the lower forms. The essential characteristic of these is that they require little or no practice, and no learning, for their exhibition. This fact is the explanation of the common tendency to credit the lower forms, as also the lower mammals, with an individual and even conscious purposive activity of which they are incapable. As well might one credit the human infant with responsibility for the sensori-motor emotional reactions it shows perfectly from birth, whilst it requires weeks or months gradually to acquire the elementary use of its eyes and hands in the practice of movements which need much trial for their coördinate exhibition.

Mammals vary greatly in their degree of maturity at birth. Guinea-pigs, except for size, are in their ordinary activities practically adult at birth; calves and pigs walk soon after birth; rats, when quite fœtal in appearance, exhibit quite remarkable powers of locomotion, and they are sexually adult before they cease to suckle; cats and dogs are blind for several days after birth and, particularly the latter, are clumsy in their movements for weeks; the human baby is helpless at birth and cannot stand for many months, and

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it is still relatively helpless at the age at which a rat is dying of senility. These facts accord in general with their position in the mammalian scale as regards the evolution of purposive activity or mind.

Very few guinea-pigs attempt to climb out of the box in which they are kept and which therefore needs no cover. Cows and pigs in general exhibit little "sense" or understanding, though individuals can be taught tricks. Horses, high in the order Ungulata, are much more educable and adaptable, and may attain considerable skill in various directions. The term "horse-sense" indicates at once the limitations of the horse-mentality and the fact that this animal possesses mental capabilities worthy of note. Dean Swift's anthropisation of the horse is of interest in this connexion. Rats are much over-rated mammals and depend for their survival on their rapid reproduction, their untiring energy, and their suspicion. A study of rat-haunts impresses one with their unintelligent persistence and waste of energy. They will burrow unintelligently for weeks to attain their end, but on the other hand are readily frightened by a hanging piece of fish-netting which moves when they touch it. Adult males will store quantities of food and keep guard over it against all comers. I have known such to kill the greater part of the contents of a brooder of well-grown chickens during a night and store them under the floor, leaving them there and going to its usual lair. It must have been tired of killing and storing, and full of food. A higher carnivore would have killed every living thing or merely killed and removed the kill, perhaps doing involuntary damage during the procedure. A fox would usually have done the former and a cat the latter.

I now turn to the detailed indications in mammals of purposive or individually acquired activity, or mind, and for this purpose will choose the dog. A dog knows its home and its master, answers its name, follows its master about, understands many gestures and tones of voice, and readily learns to fetch and carry. Its sight, except in the case of certain sporting dogs, is relatively poor in comparison with the high development of the sense of hearing and the extraordinary delicacy of the sense of smell, together with a most retentive memory. Ordinarily it reacts to sensory stimuli or sleeps. It definitely exhibits the power of associating sensations, and also that of choice. It often confirms vision by smell and wags its tail as evidence of this. At times it may both hear and see a known person approaching, but remains in doubt until it has obtained confirmation by smelling the trousers. In such cases a pair of new trousers on its master may at first cause a quite ludicrous exhibition of doubt. Choice with understanding of the purpose to be served is often shown by sporting dogs, and especially by sheep dogs. A terrier, smelling the actual presence of a rat, does not go blindly to work unless the scent is very strong, but will often pause and look around, and at times wanders around and then definitely and voluntarily tries some other spot where success seems more likely.

A dog when he has made a kill will return to the same spot as if he expected a repetition. I have known a young child, who has seen a rabbit suddenly run away, want later on to return to the spot to see if it has come back again. The reaction in the two cases seemed exactly the same. Dogs will succumb to temptation like higher mammals. One of my best terriers, who would protect the fowls against all comers and never dream of harming them, would occasionally when alone with a stray chicken slink around in a manner quite unlike his usual behaviour and eventually snap at and kill it and then make himself scarce with his tail down. Dogs can readily be taught tricks and enjoy them like children. I knew a dog who ignored his master in the neighbourhood of railway stations and travelled invariably under a seat, wandering quite casually into the train through the open door by which his master had entered. After the journey he invariably joined up a short distance from the station, wagging his tail and otherwise indicating his satisfaction with his exploit though of course he was unaware that he had saved his railway fare.

Cats never reach the mental level of the dog. They condescend to live in a house rather than belong to it. They are aloof and solitary unless they want anything and then they are most persistent. They rarely answer their names or follow like dogs. It is however a pleasure to watch a good cat teaching its kittens to eat dead mice and birds, to play with and eventually to kill them, and to search for and capture them, and to climb trees and to sharpen their claws. The domestic dog rarely or never goes beyond bringing food to its young and playing with them and teaching them to fight.

This definite indication of elementary mental processes in contradistinction to mere, if skilful, reaction to sensations is a great step upwards. The next step towards the humanoid level consists in the special adaptation of the forelimbs for skilled movements, and in the capability to initiate and to employ tools purposively. This latter has been conclusively proved by the classical experiments of Köhler with chimpanzees. An untrained chimpanzee has employed a long stick to reach a banana hanging beyond jumping distance. The first method employed was to plant the end of the stick on the ground and climb up it. A more difficult feat was the placing of boxes one on the other and reaching the banana from the top box. An even greater indication of intelligence was the lengthening of a cane by the insertion of a thinner cane into one end. Here is definite evidence of a mind on a level with that of a human child of some two and a half years of age.

By "mind" I here mean "sense," "understanding," or "brains" in the popular and at the same time the best and proper sense—that is, the rapid appreciation of a situation and of the appropriate action needed for its solution. Mind in this sense does not necessarily connote either the employment of the human speech mechanism, the ability to absorb and store facts, or a notable facility and skill in action. To "mind" in this sense the first of these is a weapon and the others are qualities of structure making for facility of understanding and action.

The Cerebrum or Organ of Mind

In the sauropsida the cerebrum has not developed, but in the highest member of the class aves, the parrot, which possesses unusual motor capabilities by the independent use of beak and feet, the anterior commissure, small in the province, is unusually stout, and a definite precursor of the pyriform lobe of mammals, connected with the olfactory lobe, lies in the roof of the rudimentary lateral ventricle. The lowliest mammals, the ornithodelphia and also the didelphia, possess a very large anterior commissure, and also a rudimentary corpus callosum connecting the small cerebral hemispheres. In the hedgehog, the brain of which is almost equally elementary, the olfactory lobes are very large, the anterior commissure is very stout, and the corpus callosum, though still small, is better developed. The cortex of the rudimentary cerebral hemispheres possesses a pyramidal or supragranular layer of nerve-cells.

During the ascent of the mammalian scale the cerebral hemispheres with the corpus callosum increase in size and complexity, the anterior commissure remaining very small, and the depth of the pyramidal layer of nerve-cells increases relatively to that of the rest of the grey matter.

Remarkable differences exist in different mammals in the degree of maturity of the cortex cerebri. In some the cells are largely embryonic in structure; in others again they are adult and presumably in full functional activity.

It seems likely that the latter, e.g., the rat, the guinea-pig, and the pig, are structurally incapable of further evolution and have reached their best; and that in the former, e.g., the dog, further development of function is still possible but is hampered by a bodily structure of an unsuitable or insufficiently plastic character.

The available evidence definitely indicates that the cerebral hemispheres in their development precede

FIG. 1.—Sagittal section of brains of (*a*) man, (*b*) goose, and (*c*) cat. The grey area in each brain represents the optic thalamus, the white the cortical representation of the sense of smell, and the black the afferent and efferent tract region. The smell area of the goose, lying above the thalamus, is in the cat and man, by the enormous development of neopallium pushed outwards, downwards, and then inwards until it lies below and outside the tract region instead of above the thalamus.

and incite where possible the evolution of suitable physical structures for the performance of skilled individually acquired activities, in other words, that the cerebral hemispheres constitute the organ in which the urge to the further development of mind is largely located.

In the primates, naked-eye indications of the primary functional divisions of the cerebrum are indicated by the furrow of Rolando, which separates the frontal or psychomotor or executive part from the rest of the hemisphere, which is receptive and elaborative in character. Of the latter the important and first evolved visuo-sensory area or area striata is indicated by the calcarine fissure, the area for bodily sensibility lies behind the furrow of Rolando in close association under its base with the adjacent Betz-cell or psychomotor area, the auditory area protrudes on the first temporal gyrus through the upper part of the fissure of Sylvius, and the rudimentary areas for taste and smell lie in the pyriform region. Around these primary areas of sensation extend concentric zones of differentiated cortex, the whole of these intercommunicating in an extremely complex manner and serving as the physical basis for the reception, recording, and combining of sensations into complexes.

The human brain differs from the anthropoid both in relative size and in the proportionately great superficial extent of the area allotted to the commissural zones. It is however in the pre-Rolandic, psychomotor, or executive region of the hemisphere that the most important structural elaboration occurs during the evolution from primate to anthropoid and from anthropoid to man. The agranular Betz-cell area is proportionately large, but the anterior and adjacent agranular region is proportionately much more extensive in association with the function it subserves, that of individually acquired skilled activity. Still more forward the frontal area, which is represented in the primates alone, is proportionately large. The essential feature of the human brain, as distinct from the anthropoid, is, however, by the development of the fronto-marginal system of sulci, the interposition of a large wedge of cortex as a prefrontal lobe with its base forwards and extending backwards to the posterior trisection of the second frontal gyrus. This, in association with the great relative increase in size of the inferior frontal gyrus, causes an outward thrust above the outer part of the orbit and the development of the human forehead.

Throughout the frontal lobe of the primates, which, however, is better developed behind than in front, the cortex is characterised by the relatively great depth of the outer cell, supragranular or pyramidal layer of nerve-cells, and this is more marked throughout the frontal lobe of man. The much greater superficial area of this layer, in comparison with even the anthropoids, owing to the deep and elaborate fissuration of the relatively much larger human cerebrum, provides a convincing explanation of the difference between the mentality of the two animals, when considered in association with the superadded prefrontal region of man.

I will add the shortest reference to the germane pathological evidence. In idiots of anthropoid mentality or less, the prefrontal region is not developed; it is small in cases of imbecility and marked mental deficiency; and it is grossly wasted in cases of gross dementia with permanent loss of volition. Further, the motor symptoms common in certain types of premature dementia (dementia præcox), and also seen in isolated form in certain cases of hysteria and certain hypnotic states, bear a remarkable resemblance, amounting almost to identity, to those recently produced experimentally by ablation of the psychomotor and frontal regions of monkeys by Fulton, Jacobsen, and Kennard.

It is thus no exaggeration to state in general terms that the Betz-cell area is the seat of origin of the cruder individually acquired skilled movements, the agranular psychomotor area that of the more highly elaborate skilled movements including speech, the lower facial movements and writing and the move-

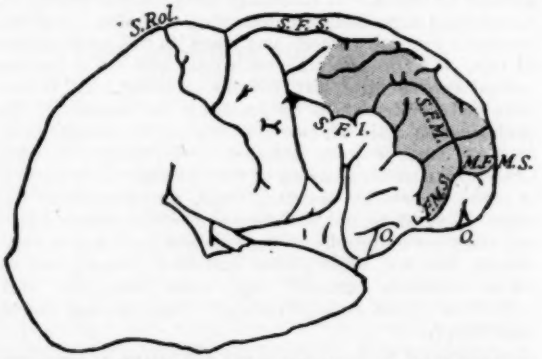


FIG. 2.—Tracing showing the fissuration of the frontal lobe of the hemisphere of a human fœtus of some nine months. S. Rol., fissure of Rolando; S.F.S., superior frontal sulcus; S.F.I., inferior frontal sulcus; S.F.M., sulcus frontalis medius; M.F.M.S., median fronto-marginal sulcus (Wernicke); L.F.M.S., lateral fronto-marginal sulcus (Eberstaller); O., sulci of orbital surface. The shaded area indicates the limits of the purely human "prefrontal" fissure system.

ments of the eyes, the frontal area is essentially coördinative, and the prefrontal area is the seat of volition and of voluntary control and inhibition of cerebral activity.

The Human Mind

I will now return to the consideration of mind, which I had traced to the level of the chimpanzee (that of a human child of 2½ years). Here the employ-

ment of simple tools or external methods is first seen, and a language mechanism is still unnecessary.

During the glacial period a steady advance towards the stage of modern civilisation took place. This is indicated best by a short list of acquisitions during the period, such as the domestication of animals, agriculture, the use of metals in place of flint, the making of pottery, the weaving of linen, and still more important, the erection of sacred monuments and the employment of special modes of burial and of funerary rites. Some few of these may have been possessed by Neanderthal man, who, there is reason to believe, possessed only a rudimentary language. The majority are undoubtedly the discovery of homo sapiens, whose dominance was consequent on the possession of the prefrontal cortex and the large inferior frontal gyrus to which I have just referred. In addition, he acquired cervical and lumbar curvatures with a more plastic and less robust physique, a plastic thumb and hand, and a rapidly evolving speech and language. The necessary consequence was the development of what we call civilisation, not we may be certain a final goal, but merely an existing mental dominance capable of indefinite extension.

Language as heard and spoken long preceded civilisation, and has been recorded as cuneiform and hieroglyphic writing by the early civilisations of Mesopotamia and Egypt, and much earlier as crude pictorial representations. In one form or another language has exerted such a powerful influence on the evolution of mind in man and is so intimately associated with this that it causes no surprise that the one is so commonly regarded as the equivalent of the other. This, however, is by no means the case, language being merely the symbolical instrument of mind and not its compeer, although in some form or equivalent it is indispensable for the full evolution of the complex cerebral changes whose final end is individually acquired skilled psychomotor activity.

Mind without language may be seen in a fairly pure form in congenitally deaf and dumb persons, who have not had the opportunity of acquiring education by the deaf and dumb alphabet or by lip-reading. In such, understanding and intelligent descriptive mimicry may reach a high standard, and the ability to appreciate a situation and to respond by a suitable motor reaction is very noticeable; in fact, remarkable.

THE WEAPON OF LANGUAGE

For the further evolution of mind a symbolic system to permit of generalisation, qualification, and abstraction is essential. The language mechanism has been developed for this purpose and, as heard and spoken language, has served for long ages as the essential means of acquiring and of communicating elementary knowledge.

Language as written and read, though employed by the use of clay tablets and papyrus thousands of years ago, is a more recent acquisition in the case of the majority of persons but possesses the advantage of enabling the individual to spread and to acquire and permanently to record knowledge to a degree impossible to the spoken word. The reading and writing mechanism is, however, less fundamental, and is more allied in character to the symbolic system employed by mathematicians and more recently by chemists and physicists. Of less definite and hence less useful and common methods are the equally symbolic systems of music, painting, and sculpture. It is an interesting fact that whereas the earliest human records are pictorial and later in symbol, language heard and spoken has served, except to the very few, as the essential means of communication and of acquiring knowledge, not merely to modern times but almost to the present generation of civilised man. Through the recent spread of education in the more civilised races, more or less accurate information is available to all in the daily press, and cheap literature exists as a flood. The most recent methods of spreading information and knowledge—namely, the cinema and the wireless—are of too recent date for their possibilities and future to be assessed.

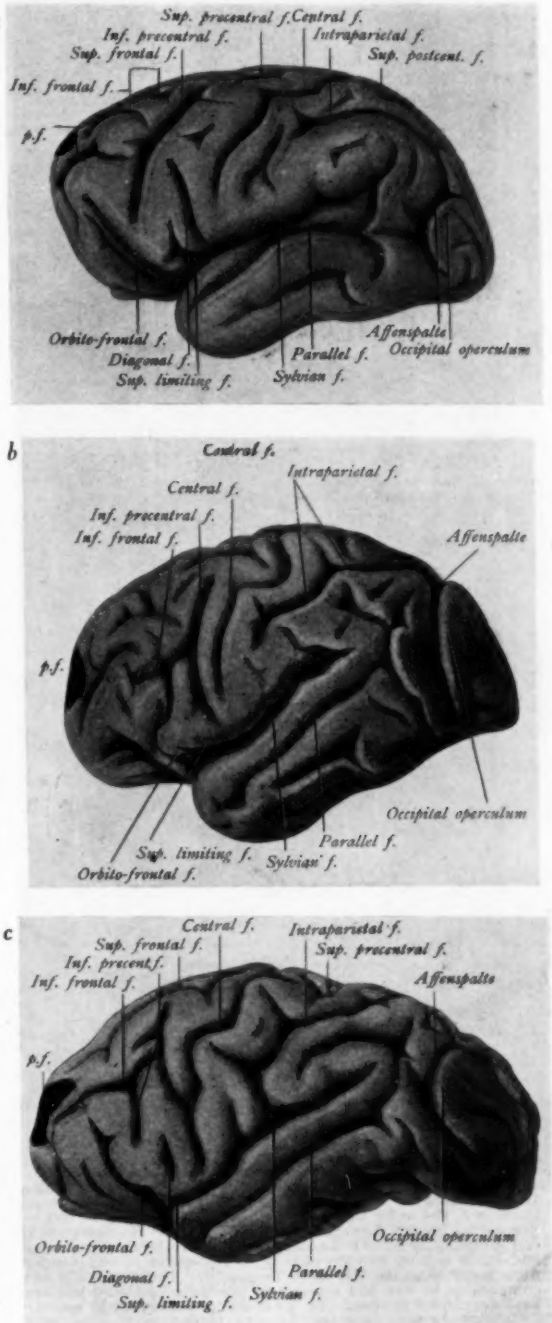


FIG. 3.—The approximate site of the "prefrontal" area is indicated on the three drawings by Cunningham of the left hemispheres respectively of (*a*) the orang; (*b*) the chimpanzee; and (*c*) the gorilla. In the gorilla alone can it be said that a rudimentary prefrontal area is present. In the chimpanzee and the orang it is merely possible to indicate its site.

PURPOSIVE VOLUNTARY ACTIVITY

The essential function and purpose of the human mind is, however, not merely an acquisition and recording of knowledge. Reaction in the form of skilled voluntary activity, including voluntary thought, is its essential end. During dreaming, owing to irregular activity of complex associated groups of post-Rolandic cortical neurones with consequent elevation of irregular groups of recent and remote memories above the threshold of consciousness, all kinds of grotesquely associated and impossible scenes are witnessed and accepted without criticism as fact. During day-dreaming, scenes and verbal memories are passed in review, but the critical faculty is instantly awake if these verge on the impossible, or even exceed the credible. Here the pre-Rolandic brain may be said to be standing by on guard. In voluntary thought, on the other hand, scenic and verbal memories are passed in review, selected and rejected, and associated into a satisfactory form. During the process of thinking to oneself psychomotor activity in the form of slight articulatory movements or faint respiratory variations are, with fixation of the head and neck and fixation or slight movements of the eyes, constantly present—in fact, are the necessary accompaniment of voluntary thought. During the performance of delicate and difficult motor operations requiring the strictest attention, actual inhibition of respiration is common. During composition—not copying—on a typewriter, shortness of breath following inhibition of respiration, or a feeling of hoarseness following rapid and faint articulatory movements, is not uncommon, and serves as an example of the presence of psychomotor activity during voluntary thought. Children when learning to write use their tongues as well as their fingers, and adults often unconsciously whisper to themselves as they read.

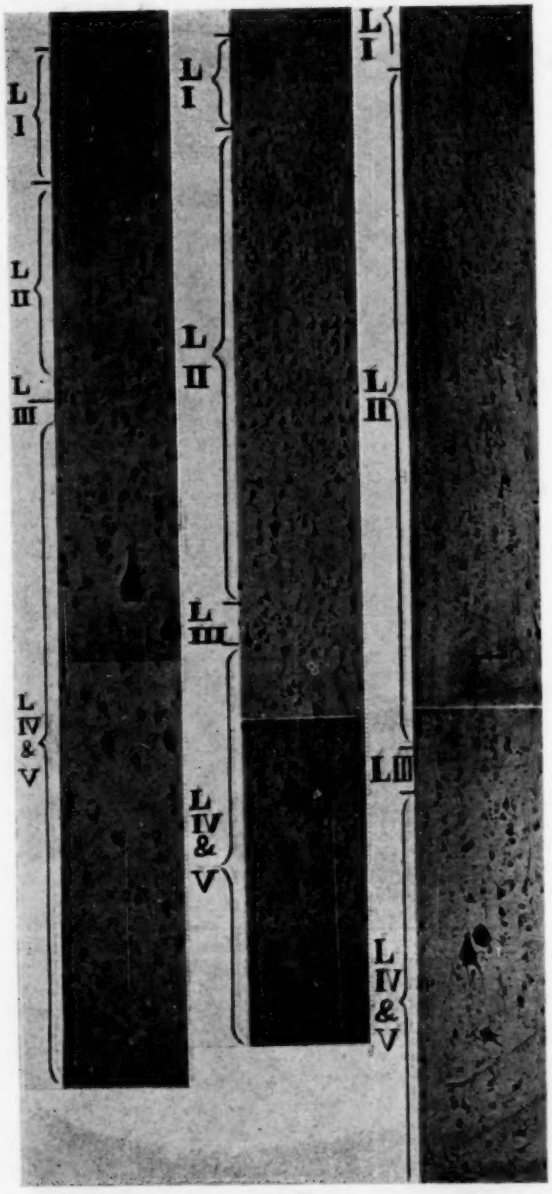


FIG. 4.—Comparable histological sections of the agranular Betz-cell area of (*a*) the dog, (*b*) the macacus, and (*c*) man. Lamina I, the outer fibre layer; Lamina II, the outer cell or pyramidal layer; Lamina III, the site of the absent middle cell or granule layer; Laminæ IV and V, inner fibre layer and inner cell or polymorphic layer respectively. The inner fibre layer contains the large Betz-cells. The Betz-cells are comparable in size and number in the three sections, but are best developed in man. In (*a*) the dog the cortex is largely embryonic in structure and Lamina II is very shallow, and occupies but a fifth of the total depth of the cortex. In (*b*) the macacus the cells throughout are well developed, and Lamina II is the prominent layer of the cortex, occupying nearly one-half of the total depth of the cortex. In (*c*) man the cortex is more highly developed. The cell-processes are more complex and much intercellular nervous tissue exists. Lamina II occupies considerably more than one-half of the total depth of the cortex.

Brain and Mind

We think in images, but the simplest mental process has a very complicated cerebral counterpart. The mere recalling of a word results in a bombarding by the psychomotor cortex of at least one sensory-receptive sphere followed by percussions and repercussions of other sensory spheres, and continuous interplay between these and the psychomotor area.

The voluntary recalling of the word "cat," for example, not only arouses a series of images of cats, but imperfect visual and also auditory images of the word "cat," and corresponding images concerning the other senses, qualifying characters—e.g., colour, size, &c., involving the arousing of words to indicate them, and psychomotor images involving the speaking and drawing of the word "cat" in simple letters or capitals, since to visualise the word as an image is otherwise not easy.

From the converse aspect, every recognised sensation involves psychomotor activity, and each process of perception and still more each process of conception is always different from the previous one, arouses different mental images, and to a varying and increasing degree involves more and more the employment of the language mechanism. Hence cerebral activity, though based primarily on a sensory and psychomotor differentiation of structure, is entirely different and infinitely complex, and possesses its counterpart not in the locally differentiated structure of the cortex, but in the extremely complex mental processes which the proper employment of the language mechanism renders possible. Even this mechanism, complicated though it is in structure, is only the basis on which is possible the development of a lengthy vocabulary of words of precise and delicate meaning. Whilst the localisation of cerebral function from the basal afferent and efferent aspects is definite, the localisation in the cerebrum of *mental* function must be for ever impossible, owing to its infinitely complex and infinitely variable characteristics.

It is possible at present to go but a short step further. We know that our general experience is recorded in the

cerebrum in a time-related manner, since in certain pathological states dissociation takes place, and whole blocks of experience may be temporarily or permanently blotted out of the general superposition. Also, accidentally aroused old memories may under hypnotic or other suggestion be made to arouse their time-related kind. This record is thus a superposition, not a haphazard accumulation. Further, in accordance with the fact that the highest purpose of cerebral function is skilled psychomotor activity, it is natural that related groupings of skilled motor capabilities should be located from the aspect of the parts of the body they employ. This localisation is not a neurological one, but a functional one solely. The secondarily related sensory localisation is similar. The parts of the body, in other words, are parts as known to the ordinary man and not as recognised by the neurologist.

Lastly I will refer to what is known as "learning by heart," the capability of recording and reproducing long and complex symbol-groupings, whether of words, figures, or music. This does not at all necessitate a knowledge of the meaning, though such may increase the facility of the process.

POTENTIAL CAPABILITY OF THE BRAIN

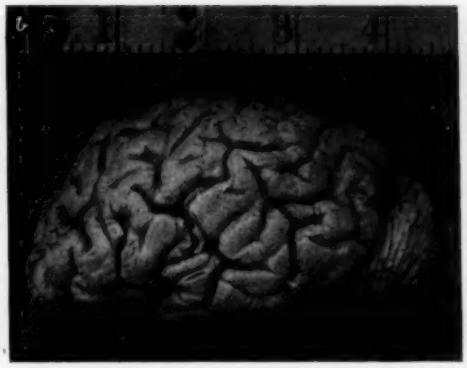
The most wonderful feature of the human brain is its extraordinary potential capability. An obvious instance is seen in the recent employment of the reading and writing mechanism and the spread of education, the potential capability for which exists in individually varying degrees amongst both the classes and the masses, and applies equally to the acquisition of knowledge and to its application to the arts and the crafts. The important, and also individually varying, factor is the grade of mind or general intelligence, which may vary from that of the imbecile or mental defective up to that of the genius, and whose psychomotor possibilities, according to its grade, are limited solely by opportunity and environment.

I will now mention the capability of the cerebrum to eplace certain serious disabilities. The long blind acquire a high development of the tactile sense and by means of Braille are able to read and write with facility and show much skill in handicrafts. The eyes, though normally employed in binocular vision, are used separately for near and distant vision in cases of unilateral myopia, the misty image being suppressed. The congenitally deaf, owing to the absence of hearing and speech, suffer a very severe handicap and at times show a mentality little above the anthropoid. Usually, however, imitative and descriptive mimicry is highly developed, and by the employment of the deaf and dumb alphabet and lip language such persons may develop relatively normally, their chief difficulty being the acquisition of language in the fuller sense with all that this implies. Such persons are often highly intelligent in their psychomotor reactions to situations or to visual stimuli—e.g., the illustrations in the daily and weekly press.

The two cerebral hemispheres are identical in size and structure though normally a differentiation of psychomotor function exists owing to the separate and different use of the two hands with normal predominance of the right, and with this is associated the unilateral representation of speech, since the speech muscles are employed bilaterally. Great differences, however, exist in different persons, and individual employment of the left hand in writing is readily acquired by some with characteristic writing. Speech through the opposite hemisphere is more difficult to acquire, since a left-sided lesion of the brain so grossly interferes with voluntary thought that serious general mental disability occurs which is too great a handicap to overcome in persons of mature age.

Disabilities due to bodily maiming are more readily neutralised, and new physical capabilities are readily acquired by practice. In the absence of hands, for example, individuals have acquired remarkable facility in the use of the feet and toes for writing and handiwork. Lastly, skilled muscular activity as an end in itself is becoming popular with the present generation, and many physical feats which till of late were performed in public for profit bid fair soon to become the habitual exercises of the many.

The cerebrum in the several races of mankind has developed along parallel or identical lines, as is shown by the capability exhibited by the better-endowed members of the different races rapidly to acquire the culture—namely, the language, higher education, and knowledge of arts and crafts—of an alien race. As an example I may mention the brilliant university careers of the coloured races in this country and the rapid acquisition of European arts and crafts by Eastern Asia. This cerebral identity amongst the chief races of mankind constitutes a problem in human evolution much greater than that caused by the differing cultures and ideals of the nations of the white race.



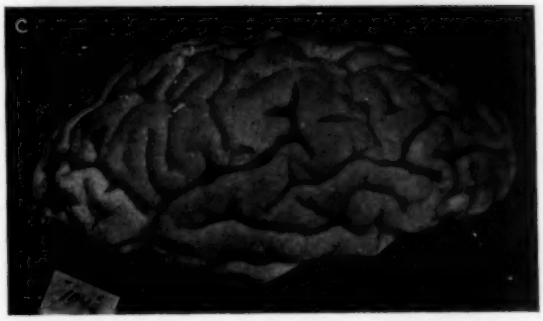


FIG. 5.—Photographs of the brains of three idiots.
(*a*) Collected by G. A. Watson. Weight 8 oz. Probably the smallest human brain on record. Cerebellum and brain stem disproportionately large. Fissure of Sylvius very short. Development appears to have ceased about the fourth month of intrauterine life. Female. Lived to adult life. Existence vegetative.
(*b*) Weight 18 oz. This brain differs from the above chiefly in size. Vascular grooves are more numerous. The cerebellum lies behind the cerebrum. Female. Lived to the age of three years. Existence vegetative.
(*c*) Weight 23 oz. The cerebellum occupied the normal position. The cerebral fissural pattern is little better than that of the gorilla. The size indicates humanoid rather than anthropoid development. Male. Lived to adult life. Could not speak. Imitative. Intelligence very low. In some respects was at the level of a child of two to three years.

THE LANGUAGE MECHANISM AND HABIT

I have frequently referred to *habit* as a common characteristic of the varying grades of living things and as the source of permanence in vital activities, the basis on which new acquisitions are founded, and an important factor and also handicap in the evolution of mind. This factor acts as a serious impediment to individual cerebral evolution and is nowhere seen in fuller operation than during the employment of the language mechanism. The purpose of this symbolic system is generalisation, qualification, abstraction, integration, &c., which processes would be impossible in a brain capable only of concrete sensory impressions and memories.

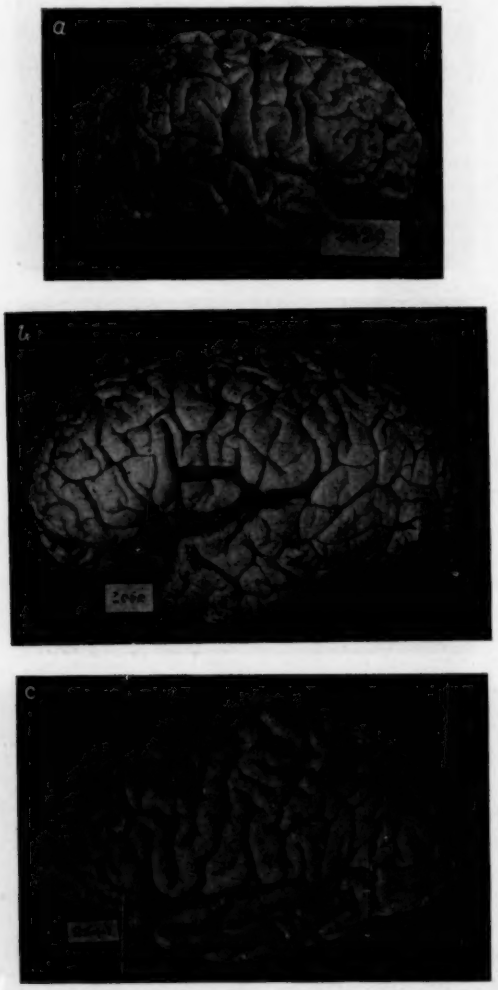


FIG. 6.—Comparable photographs of left hemispheres of (*a*) amentia, a mental defective; (*b*) a normal man; and (*c*) dementia, a gross dement.

In (*a*) the hemisphere is small, the pattern is very simple, and the prefrontal region is poorly developed.

In (*c*) is shown the gross wasting of the prefrontal region, the very marked wasting of the rest of the frontal lobe, and the considerable wasting of the adjacent parietal and temporal regions, which are characteristic of complete and permanent loss of mind.

In ordinary use, however, language is employed in a largely mechanical manner. A large part of human intercourse consists of gossip, each person repeating what occurs to him and often not listening to his companion, of the telling of stories, and of the wearying repetition of recent personal experience, &c., and any attempt at a reasoned discussion is much hampered by lack of knowledge of the subject. Actions constantly repeated tend to be performed mechanically. Some, like knitting, serve a useful purpose; others, like many crafts, result, if mechanically conducted, in a slowing down of output; others again, like certain rituals, may result in regrettable errors of commission and omission. I have myself listened to eleven commandments and an incomplete prayer. In public speaking, again, the speaker not uncommonly concerns himself more with the repetition of a string of facts he happens to recall than with the evolution of a reasoned, consecutive, and intelligible demonstration of facts and conclusions. Allied to habit, but based also on the individual peculiarities of the particular brain, is the development of stereotypism of thought and action at a relatively early age, at any age in fact from puberty upwards, under the influence of education and environment. Equally common is the development, often on insufficient bases or apparently on no basis at all, of fixed ideas, usually disguised under the word "convictions."

The language mechanism, whilst by its proper employment it serves as the instrument of high human attainment, may be and often is degraded to the level of an occupation for the passing of time and of little more real import than the whittling of a stick.

ABUSE OF THE MECHANISM

Language, as I have remarked, is the symbolic instrument of thought. To be properly employed for this purpose it is essential that its generalisations, qualifications, and conceptions should repeatedly be brought into contact with concrete illustrations of their meaning from the aspects of the primary perceptions from which they were evolved and of the psychomotor purposes which they are intended to promote. In other words, the meaning of the verbal complexes evolved needs repeated and constant elucidation by reference to the concrete. No sane person would employ the higher mathematics solely for the accumulation of elaborate and meaningless data, probably because the system requires continued mental alertness for its use, and a purpose and end are continually in view.

The language mechanism is, however, so easy for all to employ, words are so cheap, sentences are complete grammatical units, and hence a speaker or writer may meander along without end or aim in his recording of non-related word-complexes. The worst that can be said of them, apart from their futility, is that they are harmless so long as they do not lead to the acceptance of correlation between statements which are merely juxtaposed. The Rev. Mr. Stiggins was a notorious offender in this respect.

The abuse of the language mechanism, however, goes further than this. All crafts necessarily possess their technical terms, whether it be engineering or biochemistry, but each term has a concrete meaning and is employed intelligently by the worker though a disquisition containing many such may be unintelligible to a worker in another field.

On the other hand, certain cults, in contradistinction to crafts, have elaborated an astonishing terminology and literature which is often not only difficult to follow but seems void of logical defence. The literature of theosophy, spiritualism, and psychical research is an example. The objective bases of this cult are certain phenomena of cerebral dissociation which are relatively rare in the West though common in the East, and the influence of these phenomena on the followers of the cult, usually under special physical conditions. Mass suggestion plays an important part and fraudulent imitation is so easy that the function of "psychical research" is equally the elimination of the certainly false and the testing and study of the possibly true. I am concerned here with the astonishing and incredible literature of the cult and not with its major tenets and practices.

As another example, I will mention the cult of psychoanalysis, the obscurity of whose extensive and largely pornographic literature constitutes a nightmare. The successful treatment of the psychoneuroses is based on intelligent sympathy and mental domination and is not evidence of the truth of extravagant theories of mind snowed up in complex phraseology.

As a final example I will mention the cult of Christian Science, whose remarkable literature and theses are to the critical mind both obscure and unintelligible. The cult, however, possesses the saving grace of inspiring such faith in its adherents as to have earned a place amongst the religions.

On the other hand, the employment of language is seen at its best during the study of philosophy, that highest grade of thought whose purpose is the recording and elaborating of historical systems of morality with the object in view of contributing to the practical search for truth and the principles of right living, although the language in which such contributions are couched is at times very difficult to the inexperienced reader. One cannot however help being impressed with the truth that the majority of differences of opinion on the part of philosophers are primarily based on questions of definition and on the different shades of meaning of which certain word-complexes are susceptible, since many abstract terms are difficult or impossible to reduce to a concrete basis.

I must not here omit reference to the poetic art, which clothes in words numerous feelings and aspirations, to many difficult of realisation through the arts and crafts, and thus makes noble use of the weapon of language.

The word "language," of course, connotes a very large number of allied systems employed by different nations and races, and of very varying grades of complexity. Further, whilst a relatively small number of words serve the purpose for the majority of persons, a large vocabulary is essential for the higher purposes of thought, for the expression of different qualities and abstractions, and for the description of delicate shades of meaning with regard to the attributes of phenomena. If it were possible to compile the vocabularies of a large number of persons, extraordinary differences, based on education and pursuits, would no doubt be discovered.

MIND, AS DISTINCT FROM LANGUAGE

The mammalian mind, based on cerebral activity, is a totally different entity from the weapon of language. In essence it is the appreciation of a situation followed by a suitable psychomotor response. In even the most technical crafts, mind functions normally with only the occasional employment of the language mechanism, whether the worker be a ploughman, a craftsman, a surgeon, or an engineer. The understanding of the final end in view and of the means needed for its attainment constitutes mind, and it is in some instances in the degree of understanding and in others in the capability to secure the end in view that individuals differ in their degree and quality of mind. Mind, stark naked from the frills and furbelows of language which sustain or enmesh it, is shown equally by such diverse manifestations as the abolition of slavery, a noble cathedral, or a cotton mill. As I have already remarked, however, this finite human mind is but an infinitesimal element of the attributes of the Universal Mind or Source of all phenomena.

Inborn and Instinctive Urges

Hitherto I have referred to the cerebrum merely as a peculiar mammalian characteristic, but in actual practice the purposive and individually acquired skilled activities it serves are largely modified by the fact that it is implanted on a nervous system and bodily structure which already for countless ages has gradually, by a process of summation, acquired numerous inborn and unlearned purposeful sensori-motor reactions. From submammalian life, with its original feelings of pleasure and pain, is inherited the need of self-protection, hunger, and sex, and the subsidiary feelings of fear and perhaps curiosity. From the mammals comes the maternal instinct.

The first of these, *self-protection*, necessitates combat with the subsequent evolution of emulation and ambition, and finally of driving force and persistence.

Hunger extends from mere food to various needs, and may spread, as our civilisation advances, to reasoned production and distribution.

Sex evolves to the maternal instinct in mammals, and in man to the family and its descendants, and eventually by the provision of help and protection to others becomes altruism capable of extension to class, nation, race and, in fact, to all humanity. An important sidetrack is the mode of treatment of women by racial custom, which has evolved very differently in the different races and even nations. Other sex-developments are costume, regard for appearances and for the approbation of others, and the æsthetic and artistic sense.

The basal feeling of *fear* has undergone in man evolution somewhat as follows: fear; fear of death; fear of the dead; awe at the unknown forces of nature and of the supernatural, the unknown source of all; the religious emotion, which remains as superstition or is crystallised into dogma. In the individual this emotion is the source of the moral sense and the ideal of right and wrong.

Finally, the feeling of *curiosity* evolves into the desire for adventure, the search for facts, and the desire for truth.

The highest grades of emotion are personal to the individual at the present time and are not common property of the mass. As an example I will instance the moral sense which varies greatly in degree in individuals, but in a high proportion of the units of civilised mankind is the real urge to right living, in each case according to his individual personal standard. This urge remains high in the family unit and continues almost as high in the larger school and university groups as is shown by the special meaning attached to such words as "cricket" and "not done." It is high in numerous voluntary cults, such as Toc H and freemasonry. It is distinctly less high in associations of individuals for mutual advancement and protection—e.g., trade-unions. In the masses, as masses, it is much lower, as is evidenced by the tendency to mass impulse for good or evil under the influence of "slogans," advertisements, practitioners of quackery, and swindling, and by the giving of rewards beyond merit or obliquy beyond desert to individuals temporarily in the limelight. Finally, amongst the nations, although one of the higher emotions is usually evoked as a preliminary urge to action, right is merely another word for might.

The Cerebral Immaturity of Man

This full functioning of the higher emotions in the few only is merely an indication of cerebral immaturity, of which we have further and definite evidence in the existence of developmental mental disease amongst us. The prefrontal region of the cerebrum is the last part of the brain to evolve, it differs in degree of development and complexity in different individuals, and it is the first part of the brain to retrogress. Many brains cease to develop during the latter months of fœtal life or in infancy and childhood, their possessors exhibiting an appropriate mentality. Many relatively normal or even well-endowed brains survive the strain of normal function to puberty only, being unable to resist the strain of adult activity. Such develop premature dementia with loss of the higher cerebral units. Throughout adult life similar but usually less

disastrous failures to survive occur, and old age produces a rich harvest of dementia, with gross wasting of the prefrontal region and the mentality of an infant. Developmental mental disease is thus the result of such immaturity and defective resistance to decay as is natural in a newly developed part of the nervous system.

The same conclusion is reached by a study of the races of mankind. Neanderthal man, after living for hundreds of thousands of years with his gradually evolving rival homo sapiens, gave place to him with the closing of the last ice age. The latter has progressed immeasurably in civilisation, but relatively much less in basal characteristics. By interchange of local customs and culture, and the gradual evolution of arts and crafts and of language, man has advanced from a savage whose highest art was the painting of interesting or sacred objects on the walls of caves, and to whom agriculture was unknown, to a civilised being living in communities on a racial scale.

Of the civilisations past and gone I will merely enumerate the splendour of Mesopotamia, the grandeur of Egypt, the crafts of Crete, the art and learning of Greece, and the power and law-giving of Rome. The last, after long relative chaos, has given place to the science and engineering of the white race. Of the Eastern nations we know little beyond the fact that in numbers they constitute the major portion of the human race, and that they have of late superposed Western culture and crafts on their national customs and ideals, and one at least has become one of the great powers.

The chief nations of the white race differ amongst themselves in customs and ideals, but possess and have jointly evolved a similar culture. They jointly possess such a strong national urge that amalgamation seems very unlikely. The mere fact, however, that none of them has yet discovered the best form of government gives hope for the future. Domination by religious cults, monarchy, oligarchy, democracy, republicanism, dictatorship, and national government are all under trial. Undoubtedly much time must pass before the white race becomes able to act in unison. Homo sapiens in the present age presents an outstanding mixture of savagery, barbarism, and civilisation.

Controlled Mind or Sanity

To give a definition of the human mind applicable to all races, nations, and individuals is thus not an easy task. I think the word "sanity" serves better than any other to denote the qualities of mind common to all, and at the same time to permit of the inclusion of all types. The first necessity is initiative and volition of a sufficiently high grade to enable the individual to survive as a unit amongst his fellows. The next is such a degree of understanding and capability for the performance of skilled and individually acquired activities as is common to his race and associates. The last is the necessary degree of control over the basal and instinctive urges to action which, when unrestrained, render the conduct of the individual so antisocial to others of his race and class as to endanger the social structure, and consequently his liberty or life.

Anything below the minimum of these three requisites spells subjection, rejection, incarceration as a criminal or a lunatic, or death, according to its degree and to the human environment in which he lives. Any degree above the minimum results in a varying amount of individual domination, success, and influence over others. These three requisites for sanity exist to varying degrees in different individuals, and need for their exhibition a cerebrum capable of functioning normally according to its kind.

Whatever the future may hold for the human race, the most sane nation or race will eventually secure domination. Whether this will follow the subjection of the lower races and the evolution of identity of ideals amongst the higher, it is impossible to forecast. It is however certain that the present mixture of types cannot persist, and that in the future as in the past the race is to the strongest, sanest, and ablest nation, and not necessarily to that with the highest present culture. A fifth glacial period may be in the womb of the future, and may change the whole history of mankind, and even largely destroy civilisation. Whatever may be before us, however, man's development to a higher type, in which the still further evolved cerebral functions are guided by the higher sentiments instead of the lower instincts, is as certain as is the fact that his present domination has followed the development of a brain power greater than that of his predecessors in the long race for the evolution of mind in living matter.

ASPHYXIA NEONATORUM

ITS TREATMENT BY TRACHEAL INTUBATION

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During the past ten years the methods used for resuscitation in asphyxia neonatorum have changed as the result of the application of new knowledge of the physiology of respiration, and it is now generally accepted that the provision of a supply of oxygen, and at the same time the prevention of too excessive elimination of carbon dioxide, are the essentials for stimulation of adequate respiratory efforts. The adoption of oxygen and carbon-dioxide mixtures, and the abolition of drastic attempts at artificial respiration have combined to make the "resuscitation" of the new-born infant a help towards its recovery, rather than a hindrance.

Although the ordinary methods of treating asphyxia by clearing the upper respiratory passages, and by providing an atmosphere of oxygen and carbon dioxide are entirely satisfactory in the majority of cases, it has seemed to us that an occasional life is lost through failure of this ideal atmosphere to reach the lungs; in other words, although the essentials for oxygenation of the blood are provided, the ordinary methods rely upon the spontaneous efforts of the baby to provide the necessary lung ventilation. These efforts, even when the upper respiratory passages are clear, may be insufficient for a number of reasons.

Before considering the possible ways in which mechanical assistance can be given to overcome this failure of lung ventilation (however caused), it is necessary to have "data" on two separate processes. In the first place we must know the force required to produce the normal respiratory excursions of the chest wall, and secondly we must know the force required for the initial expansion of the atelectatic lung of the new-born infant.

In the new-born child the force required to maintain the normal respiratory excursions has been studied extensively in America with the Drinker apparatus,

and it has been shown that a negative pressure of 8–10 cm. of water is quite sufficient to cause adequate expansion of the chest wall (Murphy, Wilson, and Bowman,[1] Murphy and Sessum,[2] Murphy and Bauer[3]). The force necessary for the initial expansion of the collapsed lung has been considered by Coryllos[4] in a comprehensive review of the problems associated with the mechanics and chemistry of respiration in the new-born. Coryllos stresses the fact that the collapsed lung of the new-born infant is a solid structure made up of a number of folds of alveoli whose walls are in apposition, and that when it expands it does so not "as in a balloon," but "the lung 'opens' like a lady's fan (according to the expression of Arthur Keith)." In an experimental investigation Coryllos and Birnbaum found that a pressure of 14 cm. of water was necessary to inflate the atelectatic lung in the dog. This pressure is independent of any force required to overcome the resistance of the chest wall, and is necessary to overcome the cohesion which exists between apposed surfaces of the collapsed alveoli. This most important observation makes it clear that the effort necessary to maintain normal ventilation in the expanded lung falls short of the effort necessary to attain the initial expansion of the collapsed alveoli in the atelectatic lung. Coryllos further observes that the opening of the alveolar spaces in the normal infant is brought about more by forced expiration against a partly closed glottis (as in crying), than by ordinary inspiratory efforts.

VARIOUS METHODS OF RESUSCITATION

In applying this knowledge to the resuscitation of the new-born infant in whom for some reason or another air does not reach the alveoli at sufficient pressure to expand them, we can consider the various methods at our disposal for assisting the fœtus to attain this object.

Vigorous artificial respiration has been rightly condemned on account of the exposure to cold which it entails, and also because it is in other ways the very antithesis of the best treatment for an infant asphyxiated to the point of heart failure. Even more important in its condemnation is its futility. In a few cases where some temporary slight obstruction cannot be overcome by the spontaneous efforts of the baby, it is true that the added force supplied by the movements of artificial respiration may be sufficient, but as a general rule it is too much to expect to attain a negative pressure in the bronchial system equivalent to 14 cm. of water.

Passive respiration in the Drinker apparatus is obviously an excellent method, and in America, where it has been widely used, it has given good results; but in view of the fact that a greater force is needed for the initial expansion and unfolding of the alveoli than is required for maintenance of respiration in the expanded lung, it would seem that pressures of the order of 15 cm. of water rather than of 8–10 cm. are necessary. Murphy and Bauer[3] have recorded the results of post-mortem examinations on infants who have died after treatment in such an apparatus used at the usual negative pressure of 8–10 cm. of water, and they have been disappointed to find a high proportion of cases in which large areas of lung were still completely unexpanded. As a result of these post-mortem findings they have suggested that better results would probably be obtained if a negative pressure of 15 cm. were used. The rhythm of respiration is of course supplied by the Drinker machine, and expiration occurs when the negative pressure returns to zero, but the same observers have discussed the augmentation of the expiratory effort by creating a positive pressure in the machine to alternate with the negative pressure. There is one objection to the application of the Drinker apparatus to the special problem of resuscitation of the new-born, in that it makes no provision for maintaining the patency of the laryngeal strait. We would point out that flaccidity of the laryngeal muscles in cases of prolonged asphyxia may be an important cause of obstruction to the free entry of air, even though vigorous inspiratory efforts may be induced. The disadvantage of the apparatus is obvious, in that it is cumbersome, costly, and, in this country at least, not usually available.

Forced inspiration through variously modified face-pieces in an attempt to cause air to enter the lungs under positive pressure is a well-known method, and in its crudest form takes the form of mouth-to-mouth breathing. The risk of distending the stomach and the lack of precision possible are sufficient reasons for not adopting it in any but the most extreme circumstances.

Laryngeal intubation and *insufflation* direct into the trachea has so many obvious advantages that it can only be technical difficulties which have kept it from general use. There must be few obstetricians who have not at some time or other attempted (with more or less success) to pass a catheter into the trachea in some case of asphyxia neonatorum. A few must have worked out a simple technique for their own use, and DeLee,[5] for example, illustrates and describes for routine use in unresponsive cases a tracheal catheter which is inserted by guiding along the finger, and through which the accoucheur can inflate the infant's lungs with his own breath.

The difficulties in the introduction of the tracheal catheter and the possible dangers of rupture of the lung from uncontrolled pressures have been sufficient to prevent intratracheal insufflation from being widely used. In 1928 Flagg[6] in America published details of the apparatus and technique which he had devised for direct vision intubation of the trachea, and for insufflation of an oxygen and carbon-dioxide mixture under an intermittent regulated pressure. Although his method and modifications of it have been used in America, we have been unable to find any evidence that a similar procedure has been adopted at all widely in this country. Indeed, when we devised the apparatus and the technique here described, we were ourselves unaware of Flagg's work. Being convinced of the value of the endo-tracheal catheter when passed by touch, we had made a small direct-vision pharyngoscope which enables anyone to intubate the trachea with ease.

THE AUTHORS' METHOD

The pharyngoscope, which has been made for us by Messrs. Down Bros., of London, is a modification of Howarth's Chevalier Jackson's instrument. The spatula has been considerably shortened and the whole instrument made smaller so that it can be used on a new-born infant. The greatest outside diameter of the speculum is 1·6 cm. and its total length is 10 cm. The upper respiratory passages having been cleared of mucus, the baby is held by an assistant with its head overhanging the table on which it lies, so that the necessary extension of the head can be easily obtained. The pharyngoscope is then introduced over the tongue. It is not necessary to pass the instrument beyond the base of the tongue in most cases, for when the tongue is pressed forwards the epiglottis moves with it and the vocal cords are exposed to view. The cords are usually relaxed and offer no resistance to the passage of the catheter.

which should be slightly moistened with olive oil. It must be remembered that the trachea in the newborn infant is short and that it is unnecessary to introduce the catheter more than an inch. If passed too far it will pass into one or other main bronchus and may even fill the smaller lumen so that there is no escape for the gas.

The catheter used is a Magill's silk web endotracheal catheter, and as the pressure obtained in the bronchial system depends not only upon the pressure with which gas is delivered through the catheter, but also upon the ease with which it can escape through that part of the glottis not occupied by the catheter, the size of the latter is of importance. From experiments to be described later we have found that for a premature infant of 5 lb. or less a No. 3 catheter is suitable, but for bigger babies we recommend a No. 4.

The rest of the apparatus consists of a device for delivering a CO_2-O_2 mixture at a known and easily variable pressure, and although we have used a bottle with an escape safety-valve and a water manometer for this purpose, we prefer the following arrangement with a rubber bag (Fig. 1). The rubber bag (about 9 in. in diameter) is the one supplied for use with the Sparklet apparatus, and it is connected with an aneroid manometer, and a glass connexion which fits into the funnel-shaped end of the endotracheal catheter. The requisite pressure of the gas can then be obtained by manually compressing the bag, and by altering the degree of compression intermittent insufflation can be produced if desired.

The whole object of the insufflation is to ensure the primary unfolding of the atelectatic lung, and this requires a pressure in the bronchi at least equivalent to 15 cm. of water. Our experiments have shown that to produce this with the catheters recommended a pressure of about 30 cm. of water is

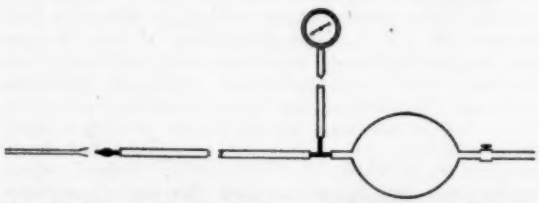

FIG. 1.—Showing the arrangement for insufflation through the intratracheal catheter. The rubber bag can be filled with oxygen-carbon dioxide mixture by means of the tube shown on the right-hand side. The tube by which the gas escapes from the bag is connected to the intratracheal catheter by means of a glass connexion and a manometer is also attached to this tube by means of a T-piece.

required in the gas delivered from the bag. We do not think that there is anything to be gained by delivering the gas at an intermittent pressure in an attempt to simulate the rhythm of respiration; indeed, a spontaneous expiratory effort on the part of the baby against the positive pressure can only assist in the expansion of the alveoli, and is an excellent imitation of the vigorous crying of the normal infant. Any attempts to allow for expiration by rhythmic alterations of pressure are unnecessary because the distension of the bronchial system is a very strong stimulus to the expiratory movements, and furthermore the baby will quickly develop its own respiration-rate, which is usually so rapid that it is quite impossible to synchronise alterations made by varying the pressure in the bag. We would point out also that provided a continuous flow of oxygen through the bronchial system is provided, the movements of respiration are not necessary for the process of lung ventilation, which can be adequately maintained in the complete absence of respiratory movements.

As soon as the primary distension of the alveoli has been accomplished oxygenation of the blood rapidly occurs, so that the medullary centre recovers its sensitivity and the flaccid laryngeal muscles recover their tone. Thus it is seldom necessary to leave the catheter in the trachea for longer than a few minutes; but if cyanosis subsequently recurs the operation should be repeated.

The position of the infant during insufflation is important. It should lie flat on its back at an angle of 15 degrees with the horizontal, head downwards. Murphy [7] performed experiments on cats kept alive in a Drinker apparatus after being poisoned with curare; he introduced fluid into the trachea, and showed that this was not drawn into the lungs by a negative pressure sufficient to maintain life, provided that the animal was kept at an angle of 15 degrees with the horizontal with the head downwards.

We have performed experiments to demonstrate the relationship between the different gas pressures in the catheter and in the lungs when catheters of various sizes have been introduced through the larynx. The lungs were enclosed in a pressure oncometer, with the larynx left protruding from the instrument to which a water manometer was attached. The trachea was then intubated with a catheter, and gas at a measured pressure was introduced through this. The pressure in the lungs as recorded on the manometer was then noted. The experiment was repeated several times using a different pressure in the intratracheal catheter on each occasion. The corresponding pressures in the catheter and in the lung were then plotted against one another and graphs drawn.

Two such results are shown in Fig. 2. It will be seen that with a 4 lb. infant, using a No. 3 catheter, the gas must be delivered from the catheter at a pressure of 32 cm. of water to produce the minimum pressure in the bronchial tree of 15 cm. of water which is required to inflate atelectatic lung. Using a 7 lb. infant and a No. 4 catheter, the gas must be delivered at a pressure of 31 cm. of water. Our own experiments on stillborn infants have shown that expansion of the lungs begins at a pressure of 15 cm. of water, but that to expand anything like the bulk of the lung a pressure of 20 cm. is necessary, and therefore the gas must be delivered from the catheter at a pressure of 35 cm. of water. We also noticed that the right lung expanded before the left. These sizes of catheter have been finally chosen because they are easily passed without causing injury to the larynx, and we have found that in actual practice they give satisfactory results.

We have considered the possible dangers of a sudden obstruction to the outflow between the catheter and the larynx, such as might be caused by a tough plug of mucus, or by a contraction of the laryngeal muscles, but with the pressures recommended we do not believe that serious damage could occur. If a complete block did happen so that the intrabronchial pressure rose to 30 cm. of water, the lung alveoli could distend only in so far as the chest wall expanded to provide the additional space. The resistance of the chest wall to this sudden expansion would provide an inertia sufficient to prevent rupture of the alveoli by any sudden increase in the intrabronchial pressure. For this reason we believe that the margin of safety as regards pressure for forced ventilation by intratracheal insufflation under positive pressure is very much greater than the margin of

safety when negative pressures are used to expand the whole of the chest wall as in a Drinker apparatus; this conclusion is supported by the success of well-established methods of forced ventilation under anæsthesia in experimental animals, and of intratracheal anæsthesia in the human subject.

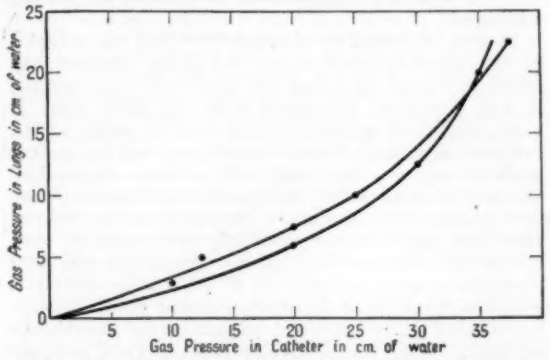

FIG. 2.—The lower curve is that for a 4 lb. infant, using a No. 3 catheter; the upper curve for a 7 lb. infant, using a No. 4 catheter.

ILLUSTRATIVE CASES

Short clinical accounts of two of the cases in which this method has been used are given to illustrate the good results that have been obtained.

Mrs. A came into labour spontaneously four weeks later than the calculated date of term. The first stage lasted eight hours, and the second stage one hour. She was given no sedatives during the first stage, but intermittent gas-oxygen anæsthesia was administered with a Magill's machine for about 40 minutes immediately before the child was born. When the membranes ruptured about an hour before delivery the liquor amnii was not stained with meconium, and after this the descent of the head prevented any further escape of liquor, so that the diffuse staining with meconium which became apparent when the child was born spontaneously was unexpected. As the head was born a large amount of thick meconium-stained mucus was removed from the mouth with a mop, and shortly after this the child made an attempt at inspiration. The cord was pulsating forcibly at about 60 per minute.

The usual toilet to the upper respiratory passages was carried out, the child was covered with warm blankets, and an atmosphere of oxygen and carbon dioxide was provided through a face-piece. Inspiratory efforts were feeble and infrequent, and it seemed that little or no air entered the trachea in response to their movements. After about five minutes the pulsations in the cord became weak and at times imperceptible, and the intervals between successive attempts at inspiration became longer—30 seconds or more. By this time the baby was pale and limp, and no reflex was obtained when the intratracheal catheter was passed. Within half a minute of insufflating the lungs at a pressure (in the bag) of about 30 cm. of water, the baby's colour had changed, and very shallow, rapid respiratory movements had become established at the rate of about 60 per minute. This insufflation was continued for a few minutes and the catheter was then removed, and although the baby did not cry vigorously for several hours, its condition gave rise to no real anxiety from the moment that the catheter was withdrawn.

Mrs. B gave a history of two normal labours; on the third occasion labour started four weeks before the expected date. After a short and easy labour she was delivered of a 5 lb. female child; there was some difficulty in getting the child to breathe and it remained cyanosed. During the ensuing 12 hours it became if anything more cyanosed, and was therefore admitted to hospital. After admission CO_2-O_2 was given through a mask, but with little effect, the cyanosis was extreme, and the baby remained lethargic; examination of the chest showed that both lungs were almost completely collapsed. Six hours later it was decided to pass a catheter and inflate the lungs by positive pressure; the improvement was immediate, a good colour replaced the deep cyanosis, the baby steadily gained vigour, and within half an hour was able to swallow glucose water. There were no further attacks of cyanosis and a week later the baby was discharged well.

INDICATIONS

We do not recommend that this method of resuscitation should be used in all cases of asphyxia neonatorum. In the vast majority of such babies spontaneous respiration soon occurs, and we can easily satisfy ourselves that air is passing in and out of the trachea with the respiratory movements. In such cases intubation is an unnecessary interference. But where respiratory movements do not quickly become established, or where, because of some mechanical obstruction in the larynx, trachea, or bronchi, air is not drawn into the lungs, we believe that the method we have described should be adopted. In such cases the muscles of the larynx and pharynx are usually flaccid, so that there is no resistance to the passage of the pharyngoscope. If any mucus is seen in the larynx it may first be aspirated before introducing the catheter into the trachea, but we do not believe that much good will be done by prolonged or repeated attempts to suck liquor amnii from the bronchial tree. We rely upon the posture of the infant to prevent the deeper aspiration of any liquor amnii which may be present, and even if fluid is forced still further into some of the lung alveoli, this is overwhelmingly compensated for by the opening up of large areas of atelectatic lung.

Other very suitable cases for this method of treatment are those in which a well-developed infant has marked atelectasis and remains blue or has repeated attacks of cyanosis which do not become less frequent with inhalation of carbon dioxide and oxygen mixture given by means of a mask or nasal catheter. The probable source of the trouble is mucus—not necessarily much—obstructing one or two of the larger bronchi. In these cases forcible inflation of the lungs should result in a dramatic cure, as one of our cases shows. Very premature or weakly babies are not so satisfactory, for although the initial inflation of the lungs may be satisfactorily accomplished, respiratory movements may be so feeble as not to maintain proper expansion.

The cases in which insufflation of the lungs are likely to be disappointing are those where the infant is drowned by inhalation of large volumes of liquor amnii, so that the bronchioles and even the alveoli are not simply collapsed, but may be actually distended with fluid. This condition is rare, but is seen occasionally in babies delivered by Cæsarean section.

We would emphasise that the proper mixture of gas to introduce into the lungs consists of 5–10 per cent. carbon dioxide and 90–95 per cent. oxygen. Pure carbon dioxide must be avoided as lethal if introduced unmixed into the lungs. The real need is for oxygen; the carbon dioxide merely ensures that this gas is not washed out of the blood to so low a level as no longer to be a stimulus to the respiratory centre.

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OSTEOMALACIA IN GREAT BRITAIN

A RECORD OF FOUR CASES

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In 1868 Trousseau [1] expressed his views on the ætiology and treatment of osteomalacia; after more than half a century these views have been confirmed. His (translated) words were:—

"Osteomalacia, the rickets of adults. Ought we to consider that there is a similarity between osteomalacia and rickets? I say we ought. The differences between them belong to the differences of the conditions in which the economy is surprised. . . It appears (from the researches of Dr. Ducrest) that the state of pregnancy causes a certain amount of softening of the bones . . . there exists, then, in pregnant women a certain kind of rickets, of which osteomalacia may be considered a more advanced stage." (Here he quotes the case of a bedridden woman with osteomalacia of 16 years' duration whom he saw in 1848.) "Well, gentlemen, this woman recovered; she recovered under the influence of cod-liver oil which I prescribed for her from the time she came into hospital, and which she continued to take long after she returned to her home."

Rare in temperate climates, osteomalacia is found chiefly in India, China, and Kashmir. Cases occur in Italy, Switzerland, and Germany, but in the British Isles it is said by Maxwell [2] to be practically unknown. An attempt has been made to trace the British cases.

Durham [3] recorded two cases in 1864; Ritchie [4] in 1895 recorded one typical case and several doubtful ones; Jones [5] in 1899 added another; the further cases traced were published by Croft [6] in 1900—one case; Fothergill [7] in 1901—one case; Hellier [8] in 1920—one case; Doran [9] in 1912 gave clinical details of the patient whose pelvis is in the museum of the Royal College of Surgeons as the Broughton pelvis; Fowweather [10] in 1926 published a case of probable hunger osteomalacia. Hunter [11] quotes a case of osteomalacia under his own care in 1931, and in 1934 Crawford and Cuthbertson [12] give details of a case of hunger osteopathy and a case of osteomalacia.

This makes 12 cases, a figure reflecting the rarity rather than the true incidence of the disease.

The clinical features are too well known to require amplification; in endemic zones the disease may affect 2 per cent. of the women of child-bearing age, and rarely it occurs in males. It manifests itself late in pregnancy with severe pains in the back and thighs, making walking difficult and the waddling gait almost characteristic. There may be tenderness of the bones of the pelvis and ribs; often there is nervousness with muscular irritability and tetany. The symptoms usually abate after the end of lactation, to recur with increasing severity in later pregnancies. The softening of the bones leads to characteristic deformities: the rostrate pelvis with narrowed outlet and crumpled sacrum; the dorsal kyphosis with rickety deformities of the sternum and ribs; fractures of the long bones and ribs. Obstetrical difficulties increase with each labour, and finally the patient becomes bedridden through pain and bony deformities.

ÆTIOLOGY

Soon after its description in Europe about 1700 osteomalacia was thought to be rickets, later to be distinguished as a separate disease of unknown causation. Ovarian disease was suggested as a cause, and changes were described in the ovaries; treatment by oöphorectomy seems to have had an effect in relieving the pains and diminishing osteoporosis, probably from an arrest of the calcium loss of menstruation, pregnancy, and lactation. Infective and purely endocrine causes have now little support. In Germany and Austria in 1918–20 [13] the hunger osteomalacia suggested many analogies with rickets, and the diseases disappeared as dietetic conditions improved.

It is to the work of Maxwell [14 15] that the solution of the problem owes most. In badly affected districts in China he found the diet very inadequate: it was composed of cereals with no meat, eggs or milk, and little animal fat; it was, in other words, deficient in vitamin D and in calcium, and the people were living on the verge of calcium starvation. Maxwell demonstrated changes in the blood calcium and phosphorus similar to those found in rickets. Howland and Kramer, working with rickety rats, found that the product of the blood calcium and phosphorus was normally 30 to 40, but in rickets it was less than 30, a figure that could result from a low level of either the blood calcium or the phosphorus or both. Many of Maxwell's cases gave a product of below 15, usually from a low calcium value. Maxwell carried out metabolic experiments on osteomalacic patients; he demonstrated a negative calcium balance, and its restoration to normal by the administration of cod-liver oil—with or without calcium—in doses of 1½ oz. daily. Calcium alone or with olive oil had no effect.

Work in India and Kashmir has confirmed these views, and it is probably true that osteomalacia is an adult rickets in patients living on the verge of calcium starvation. It is precipitated by the calcium drain of pregnancy, lactation, and, to a lesser extent, of menstruation. As with all avitaminoses, other factors may operate, especially in the sporadic cases; the effect of a digestive upset in preventing the absorption of the vitamin has been frequently recognised.

Some caution must be observed in accepting sporadic cases. Without adequate study it is difficult to differentiate osteomalacia from idiopathic steatorrhœa, hyperparathyroidism, and renal rickets. The rarity of the disease in England—the original home of rickets—remains a paradox.

CASES SEEN BY THE AUTHOR

Case 1.—Details of this case are scanty, and it is included to emphasise the change in treatment during one decade. The patient was a woman of about 50 seen in the Edinburgh Royal Infirmary in 1920 under the care of the late Dr. Rainy. The history was typical and the patient bedridden; treatment by oöphorectomy and the administration of phosphorus resulted in negligible improvement.

Case 2.—This woman, aged 48, was seen after death, in 1930, at the invitation of Dr. F. W. Mason Lamb, lecturer in pathology in the University of Birmingham, to whom I am indebted for the notes of the autopsy.

In 1905 she was a straight-limbed and healthy woman; she was a heavy drinker, and had a stillborn child in 1907—the only pregnancy. In 1912 she developed pains in the legs, refused to see a doctor, and continued to drink heavily. In 1925 the pains became so severe that she was crippled and unable to leave her house. For a year before her death she was bedridden. She had continued through all these years to drink heavily, she took little food, and refused medical advice. At the end she became comatose, and the neighbours, realising that a doctor would be called in, attempted to cleanse her neglected and verminous body; it is thought that in so doing they produced the fractures found at autopsy.

Post-mortem examination.—The body was that of a greatly deformed middle-aged woman. The right side of the chest was flattened, both legs were fractured, and both femora were broken at the upper ends. Extensive

pressure sores were present and the skin was ulcerated over the site of the fractures. The heart was atrophied, and showed fatty and fibrous changes; the liver showed some cirrhosis and fatty changes. The kidneys were both small and showed chronic interstitial nephritis. The spleen was normal, and the lungs showed terminal œdema. At the site of the fractures the bones were the seat of a disease causing great softening and absorption of the compact bone; in places the cortex was no thicker than parchment. The fractures may have occurred just before death, or perhaps soon after; there was no sign of healing. None of the ribs was fractured, but all could be bent and broken with ease. Most of the bone was absorbed and replaced by tissue resembling bone but of the consistency of paraffin wax. The condition appeared to be osteomalacia. The cleaned bones were radiographed and compared with normal dried bones. They showed osteoporosis with great diminution of the compact bone of the cortex.

Conclusion.—Death was due to exhaustion and probably uræmia in a patient suffering from osteomalacia and chronic nephritis. It is probable that this was a case of osteomalacia of the so-called "hunger" type.

CASE 3.—The patient, aged 39 (in 1930), had had three normal pregnancies with instrumental deliveries. In 1923, when she was six months pregnant with her fourth child, she developed weakness and tiredness of the legs, without pain; this progressed until she was bedridden. Immediately after an instrumental delivery she had great pain in the right leg, and could with difficulty sit up after a month. For the next five years she walked with difficulty with sticks. In 1928 she saw Dr. James Young, of Edinburgh, who found, on radiography, that the bones were osteoporotic and that there were multiple fractures of the pelvis. He prescribed cod-liver oil; the fractures rapidly healed, and she went about actively until 1930, when her fifth pregnancy began. After six weeks she developed weakness of the legs with extreme pain in the back and thighs, and after three months she came under the care of Prof. Beckwith Whitehouse and myself.

She was a very small woman, but showed no signs apart from the bony changes. The pelvis was rostrate, and measured: interspinous 9½ in., intercristal 11 in., external conjugate 8 in.; the outlet barely admitted three fingers. On radiography all the bones except the skull showed osteoporosis; the pelvis was rostrate with healed fractures of the rami.

The blood chemistry showed the following changes:—

Date.	Serum calcium.	Serum phosphorus.	Product.
July 3rd	8·5	1·7	14·45
,, 10th	11·9	2·3	27·37*
,, 30th	9·6	2·6	24·96
Aug. 27th	9·9	2·6	25·74
Oct. 1st	10·3	4·0	41·20
,, 30th	9·0	3·4	30·60
	Delivered Dec. 14th.		
Mar. 13th ..	.. 11·3	1·9	20·34

* Radiostol ℥ 30 t.d.s.

The patient was delivered by Cæsarean section of a healthy child on Dec. 14th, and sterilised; an ovary removed for examination was normal on microscopic section. The patient did not suckle the child. On getting up she felt considerable weakness of the upper spine with a tendency to curvature. This slowly improved and she continued to take radiostol. On March 15th, 1933, she was examined and found to be in excellent health; the gait was slightly clumsy, and radiograms of the bones merely revealed a little rarefaction of the upper dorsal spine.

This was a typical case of osteomalacia; the possibility of other conditions was excluded, and progress under treatment was satisfactory.

CASE 4.—The patient, aged 31 years (in 1931), was a woman in very poor circumstances. She had had no illnesses of importance. Her first pregnancy in 1920 ended in a normal labour. The second pregnancy in 1927 was associated with the development of a slight upper dorsal kyphosis. The labour was normal, but the curvature became more conspicuous during lactation. She became pregnant six months after the birth of the second child, and the curvature grew steadily worse. In addition, she had pain in her spine and shoulders. On Sept. 7th, 1931, she was examined at the request of Dr. H. J. Williams, who suspected osteomalacia. Her complaints were of the curvature, of pains in the spine, and of difficulty in raising her head. There were no signs of general disease, and tetany could not be induced. She had a severe upper dorsal kyphosis with some apparent pelvic rostration.

Examination of the blood gave the following figures:—

Date.	Serum calcium	Serum phosphorus.	Product.
Sept. 7th	10·5	3·5	36·75
Feb. 1st	9·8	2·5	24·50
,, 23rd	9·5	2·2	20·90

Later events showed that on the patient's first visit she was two weeks pregnant. No treatment was given, as it was hoped that with the softening of the bones it would be possible to straighten the spine on an extension frame and then produce consolidation with vitamin D. Unfortunately the patient refused this treatment and left hospital against advice. She was delivered of a small baby by Cæsarean section on May 24th, 1932, and sterilised. An ovary was removed but showed no pathological changes. This patient has not been seen again, but Dr. Williams tells me that her condition is unchanged, and that she is being treated with vitamin D at home. On Sept. 7th, 1931, no osteoporosis was present but there was some pelvic deformity of the osteomalacic type. As pregnancy advanced rarefaction occurred, especially in the upper dorsal spine.

This is a case of mild osteomalacia without gross pelvic deformity; an interesting therapeutic experiment was defeated by the patient's unwillingness to coöperate. In June, 1934, her condition was unchanged.

In conclusion, I should like to express my thanks to Dr. Harold Black and to Dr. C. G. Teall for the radiograms, to Dr. F. W. Mason Lamb for the pathological notes of Case 2, to Prof. Whitehouse for his coöperation in Cases 3 and 4, and to Mr. Garfield Thomas for the biochemical findings.

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THE INFLUENCE OF AVERTIN UPON THE RENAL FUNCTION

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GROSS upset of renal function as a result of operating under general anæsthesia is rare. Slight renal damage shown by a fleeting trace of albumin in the urine, or the rarer condition of a transient post-operative nephritis, evident from finding red cells in the urine, are not serious and clear up spontaneously in about two days.[1] They are found to occur in a higher proportion of patients given chloroform and ether than patients given avertin.

Patients suffering from a variety of conditions and operated on under avertin (0·1 gramme per kilogramme of body-weight), with nitrous oxide and oxygen or the minimal amount of ether in addition, have been investigated on the following lines.

A preliminary test of renal function was performed. No fluid was given overnight for 12 hours and

concentration of the first specimen of urine passed next morning examined. The blood-urea was estimated before the operation and again 24 hours after, Archer's micro-urease method being employed. All urine passed during the following days was collected and examined. Where possible the patient's weight before the operation was compared with the weight 24 hours later.

Blood-urea after anæsthetics.—There was found to be a slight rise in blood-urea after giving avertin with nitrous oxide and oxygen, and a greater rise after ether or chloroform.

TABLE I

Anæsthetic employed.	Average rise of blood-urea on day following operation. (mg. per 100 c.cm.)
Avertin, nitrous oxide, and oxygen (16 patients)	3·4 (−2·0 to +13·0)
Avertin and ether (30 patients) ..	5·8 (−1·4 „ +11·6)
Chloroform and ether (10 patients) ..	9·4 (+1·6 „ +17·0)

The influence of the age of the patient.—The rise of blood-urea is accentuated in older people [2] and greatly increased in patients who give an inadequate urine concentration test. The latter cases are excluded in the following Table showing the influence of the patient's age on the rise of blood-urea occurring after operations.

TABLE II

Patient's age.	Average rise of blood-urea on day following operation (under avertin). (mg. per 100 c.cm.)
Under 15 years (5 patients)	2·6
„ 25 „ (16 „)	3·6
„ 35 „ (8 „)	4·1
„ 45 „ (4 „)	5·8
Over 45 „ (9 „)	7·4

Water balance in the body is upset by the many factors tending to cause dehydration during the day of and following the operation. There is usually less disturbance in this connexion from avertin than from the volatile anæsthetics, there being commonly appreciably less loss of weight after avertin anæsthesia than after chloroform and ether. Adults undergoing tonsillectomy under avertin lost on average 2 lb. 6 oz., whilst similar patients given chloroform and ether lost 5 lb. 3 oz. in the 24 hours after the operation. This finding was also borne out in animal experiments in which no operation complicated the issue. Rabbits weighing about 2500 g. lost on average 29 g. when they were given avertin and 43 g. when given ether. The difference of weight loss is partly a result of there being less interference with fluid intake after avertin than after chloroform and ether, in spite of the latter involving a shorter period of unconsciousness. The comparatively slight amount of vomiting [3] that patients have after avertin is also another factor.

Influence of the blood pressure on the renal function.—The normal kidney responds to general dehydration by excreting a smaller volume of more highly concentrated urine. This involves extra work for the kidney per gramme of urea excreted. A certain amount of dehydration from lessened intake and increased evaporation and from vomiting is practically unavoidable after any general anæsthetic. Anæsthesia also usually involves a lowering of the blood pressure,[4 5 6] sometimes considerable and this again puts the kidney function to disadvantage. It is found experimentally that a complete cessation of the excretion of urine may follow immediately upon the administration of avertin for 20 to 90 minutes.[7 8] This may be partly due to the fall in blood pressure and probably also to a temporary slowing up of the functions of the tisues generally, including the kidney, as a result of the distribution of the anæsthetic.

Table III. shows the influence that the nature of the operation has upon the renal function.

TABLE III

Nature of operation (under avertin).	Average rise of blood-urea on day following operation. (mg. per 100 c.cm.)
Tonsillectomy cases in adults (14 patients) ..	4·6
Other cases excluding abdominal (12 patients)	3·6
Abdominal operations (8 patients)	7·0
Thyroidectomy for hyperthyroidism (8 patients)	2·6

Thus abdominal operations tend to send up the blood-urea more than other operations. Hyperthyroid patients show less rise than occurs after operations for other conditions.

CONCLUSIONS

In spite of the conditions which tend to hamper the renal function during anæsthesia, nitrogen excretion is actually very little upset by the volatile anæsthetics and less so by avertin. Even with the decreasing reserve of kidney function coming on after middle age, when renal excretion is more readily disturbed, it does not assume dangerous proportions, and of itself the influence of avertin upon the kidneys forms no contra-indication to the use of avertin in older patients; in fact avertin appears to be slightly more favourable as regards post-operative renal function than the volatile anæsthetics, just as it has also been shown that avertin is less damaging to the liver.[9 10]

I am indebted to the late Prof. Pembrey, Sir Francis Shipway, and Dr. A. A. Osman for their kind help and suggestions. The work herein described was undertaken at the instance of the Anæsthetics Committee, jointly appointed by the Medical Research Council and the section of anæsthetics of the Royal Society of Medicine, and was assisted by a grant made from a legacy under the will of the late Sir Horace Plunkett.

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Clinical and Laboratory Notes

MESENTERIC CYST CAUSING ATTACKS OF SUBACUTE OBSTRUCTION IN A CHILD

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A CHINESE boy, aged 6, of healthy parents, was brought to the Kailan Mining Administration Base Hospital for treatment complaining of a lump in the abdomen, which had been noticed for the preceding three years, and had slowly increased in size.

During the last twelve months the child had on several occasions been seized with attacks of abdominal pain, associated with tenderness over the lump, and vomiting, but these passed off in the course of an hour or so. No history of any previous abdominal injury was obtained, nor had he ever had any serious illnesses. The child appeared slightly wasted, but otherwise healthy. A large round, smooth tumour could be felt immediately below and slightly to the right of the umbilicus, and caused a definite one-sided protuberance of the lower abdomen.

On careful palpation this was painless, cystic in character, and displayed limited mobility in all directions, giving the sensation of a tense, fluid-containing tumour, with slight fluctuation. On general examination no abnormalities were found in the heart or lungs, and urinalysis was normal. The patient had a temperature of 99·4° F. and a pulse-rate of 80, and complained of no other symptoms than those mentioned. A blood count showed: red cells, 4,300,000; white cells, 7800. A differential white count was normal, and no eosinophilia was present.

Diagnosis.—The long history, clinical signs, absence of pain between attacks, and limited local mobility indicated a cystic tumour of innocent character, probably a mesenteric cyst. An abnormally mobile right cystic kidney or hydronephrosis was considered, but there was an entire absence of any significant urinary symptoms. Hydatid cyst also required consideration, despite the absence of eosinophilia. In view of the history of attacks of abdominal pain an exploratory operation was advised.

Operation.—On Sept. 2nd, 1934, under ether anæsthesia, the abdomen was opened by a longitudinal incision in the right semilunar line, and a large mesenteric cyst was discovered. It was glistening white and the size of a coconut, being situated between the layers of the mesentery near its free border, about 12 inches from the cæcum. A coil of ileum was tightly stretched over its surface and the mesenteric vessels supplying the coil were visible spread out over the surface of the cyst (Fig. 1). Several ounces of clear serous fluid were present in the peritoneal cavity, but there were no local signs that the tumour was in any way malignant. It was obviously quite impossible to remove the cyst without resecting the adherent portion of small intestine because of its close relationship to the mesenteric vessels, and resection was accordingly performed. The cyst, together with the overlying coil of ileum, and a wedge-shaped piece of mesentery, were resected, and an end-to-end anastomosis of the intestine was performed.

The child made an uneventful recovery and was discharged from hospital on the twenty-first day after operation.

Specimen.—The tumour was a tightly distended cyst situated between the layers of the mesentery immediately adjacent to the intestine, about 12 inches of ileum lying tightly stretched across the lower part of the surface. The mesenteric vessels supplying this portion of ileum lay under the peritoneum, coursing over the surface of the tumour. On opening the tumour about one and a half pints of brownish fluid escaped. This was sterile on culture and contained some cholesterin crystals. The wall of the cyst was formed by a thick white fibrous membrane (Fig. 2), which was smooth on both surfaces and which easily separated from the mesentery. Histologically it appeared to consist of white fibrous tissue with scattered patches of granulation tissue on the inner surface, but no endothelial lining was found. A few calcified tuberculous glands were present in the adjoining mesentery. The overlying intestine was quite healthy and free from any ulceration. At each end of the loop of ileum there were signs of constriction, and it would appear that from time to time some rotation of the cyst with the loop of intestine had occurred, causing attacks of partial volvulus, with the pain and obstructive symptoms from which the child had suffered.

COMMENTARY

Mesenteric cysts are somewhat rare in childhood, when probably the commonest "lump" palpable in the abdomen is a mass of caseous tuberculous mesenteric glands. They are commonly formed by distension of lymphatic spaces, or are definitely of embryonic origin. They may be single or multiple, and may be situated at the root of the mesentery or in close proximity to the intestine. They usually contain clear fluid, but blood or chyle may be present, and in the latter case the tumours are known as chylous cysts. Such cysts may grow to an enormous size, and Wilson [1] describes a case in which 2½ litres of a fluid resembling milk were withdrawn by aspiration from a cyst situated retroperitoneally, and pushing up the transverse colon and stomach.

Mesenteric cysts may be briefly classified as follows:—

(*a*) *Lymphatic cysts.*—Similar to the one above described.

(*b*) *Blood cysts.*—Originate from the encapsulation of a mesenteric hæmatoma (possibly of traumatic origin) and are very rare.

(*c*) *Hydatid cysts* may occur in the mesentery and are usually multiple.

(*d*) *Dermoid cysts* are found in the mesentery near the terminal ileum, but are usually retroperitoneal rather than mesenteric in their situation.

(*e*) *Multiple lymphatic cysts* may be found in the mesentery and really form a type of cavernous lymphangioma of the mesentery. Smith [2] has described a case

1 2

FIG. 1.—Specimen removed at operation. The large cyst stretching the layers of the mesentery is seen with a coil of ileum closely applied to its surface. The intestinal vessels were clearly visible on both sides of the tumour.

FIG. 2.—A section of the cyst has been removed to show the definite fibrous wall, which could easily be separated from the overlying peritoneum of the mesentery.

where exploratory laparotomy was carried out for a lower abdominal tumour in a child aged 4, and revealed a polycystic condition of the great omentum, adherent to the abdominal wall. The cysts contained clear gelatiniform matter and their walls were formed by firm fibrous tissue, without any endothelial lining.

(*f*) *Enterogenous.*—These are probably formed in the embryo by bud-like outgrowths from the gut, which become separated and later on increase in size to form cysts. Desgouttes and Sicard [3] report a case in which the cyst was lined by intestinal mucosa, and seemed to be an intestinal formation.

Operations for the removal of mesenteric cysts present surgical difficulties owing to their close proximity to the intestine. As they increase in size the loops of the mesenteric vessels become spread out over their surfaces, and this close relationship renders removal by simple dissection very difficult, because of the risk of injury to the vascular supply of the intestine. The difficulty is also increased by the fact that chronic inflammatory changes around the cyst obliterate the line of cleavage from the mesentery. Resection of the associated portion of intestine with the cyst and the segment of mesentery involved is usually the safest surgical procedure in the absence of acute symptoms, although some surgeons are content with draining the cyst despite the risk of a subsequent sinus. Such tumours do not generally cause symptoms until they are large enough to be noticed and to cause pressure on adjoining organs. Occasionally, however, the weight of the tumour, dragging on a loop of intestine, tends to cause partial rotation of the two extremities of the loop running over its surface. This complication is associated with some shock, abdominal pain, distension, and vomiting, and passes off in the average case as the kink or twist rectifies itself. Finally, however, one of these attacks may culminate in acute intestinal obstruction, necessitating surgical intervention. Moynihan [4] has published such a case,

in which a mesenteric cyst was associated with a volvulus of the ileum. Fortunately it was possible to untwist the volvulus and remove the cyst by dissection. Under other circumstances, however, considerable difficulties may be encountered, especially if the patient's condition is critical, and after undoing the twist, "marsupialization" of the cyst by stitching it to the parietal peritoneum and draining it may be the safest procedure; provided the affected loop of bowel is viable, resection being deferred until later.

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IODIDE ERUPTION DUE TO WEARING AN IODINE LOCKET

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NEW fashions and habits may, among other consequences, bring new dermatological hazards. Within the last few months extensive advertising has brought to millions the hope of obtaining immunity from colds, rheumatism, and many other ailments by the wearing of a locket containing iodine. We are informed that these lockets have been on the market for many years and that there are now more than 20 manufacturers producing a number of different patterns. There is little doubt, however, that the recent outburst of competitive advertising, in the lay press and elsewhere, has swollen to an enormous figure the previously small number of persons who wore such lockets.

The locket (actual diameter = 1¼ in.).

The locket which has been responsible for the writing of this note consists of a circular metal container, about an inch in diameter, with a small loop attached for suspension. The whole is painted red. Within is found a solid, hard, dark-grey disc which is only broken up with difficulty. Both the container and the disc have a central circular perforation ¼ in. in diameter. The disc was found to contain free iodine in an earthy matrix.

It is not our purpose here to consider the merits of the makers' claims. It might, prima facie, have been supposed that the wearing of such a locket would not in any case have proved more dangerous than the carriage of many other "charms" which have enjoyed a vogue at various periods and to-day still have adherents.

The following note, however, indicates that the wearing of an iodine locket for four months resulted in the absorption of sufficient iodine to produce an iodide eruption. So far as we are aware, this is the first case of this nature to be recorded. In view, however, of the enormous number of persons who are now wearing these lockets, it would be surprising if no further cases were observed. It seems possible also that cases may be expected, exhibiting other signs of iodism or hyperthyroidism, such as have been reported in Switzerland and elsewhere, following the widespread use of iodised table salt.

Mrs. A., aged 37, a restaurant manageress, was kindly referred to one of us (R. K.) by Dr. I. J. Sachs. She showed a small red irritating follicular eruption on the chin and upper lip. This had been present for a month, and was gradually extending on to the nose and inner aspects of the cheeks. No comedones were present. Her health was good and no history could be elicited of her having taken any medicine or "tonics." She stated that there was no rash elsewhere on her body. However, when she had undressed, a dull, reddish-brown circular stain was observed underlying the xiphisternum. The patient said she did not know this was present, but it was of no importance as this was the situation where she wore her iodine locket. A dental abscess was discovered in the right upper jaw; there were no other physical signs. There was no history of coryza; in fact, the patient believed that she had been unusually free from colds while wearing the locket.

The irritation and fine character of the eruption were against a secondary syphilide and the dental abscess seemed an unsatisfactory explanation of this eruption, which suggested an early bromide or iodide exanthem. The locket was confiscated and sodium chloride given by mouth. The urine was obtained two days later.

On chemical examination (H. E. A.) the urine was found to contain a small but very definite amount of iodine in the combined state. The iodine was liberated with nitric acid and extracted with chloroform.

Conclusions.—(1) A follicular "rash," clinically suggesting a bromide or iodide eruption, appeared on the face after wearing an iodine locket, continuously for four months; (2) no medicine had been taken during this period; (3) iodides were demonstrated in the urine.

Dr. Sachs informs us that the eruption has been clearing up since the "locket" was discarded.

PRODROMAL SYMPTOMS IN PRIMARY PLEURISY WITH EFFUSION

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THE onset of primary pleurisy with effusion is described in two current text-books as a fairly rapid, even a dramatic process.

"The onset of pleurisy is characterised by severe pain caused or aggravated by the act of breathing. . . . The illness may begin with a chill and there is usually some pyrexia, . . . with it are the usual accompaniments: furred tongue, loss of appetite and malaise. . . . When liquid is effused, the chief symptom is shortness of breath, especially on exertion. . . . Fever commonly persists as before." (Taylor's "Practice of Medicine," 14th edition, 1930, p. 267.)

"The onset is usually similar to that of dry pleurisy, but the constitutional symptoms are usually more marked. There may be an initial rigor, but as a rule pain and dry cough are the earliest symptoms. . . . The onset of dry pleurisy is usually sudden with acute pain in the side, often described by the patient as a 'stitch.' Occasionally a sense of malaise may precede the pain for a few hours or even days, but this is not the rule." (Price's "Text-book of the Practice of Medicine," 4th edition, 1933, pp. 1216, 1220.)

A third is not so definite about the suddenness of the onset:

"Prodromes are not uncommon, but the disease may set in abruptly with a chill followed by fever and a severe

pain in the side. In very many cases, however, the onset is insidious, particularly in children and in elderly persons. Slight dyspnœa on exertion and an increasing pallor may be the only symptoms." (Osler and McCrae's "Principles and Practice of Medicine," 11th edition, 1933, p. 666.)

In view of these rather conflicting statements, and especially of the emphasis placed on the acute or subacute onset, we have ventured to place on record our experience of a series of 30 cases. When taking the history of a patient entering this sanatorium we have made a practice of inquiring carefully into the presence of any abnormal symptoms during a period of several years before the diagnosis of pulmonary tuberculosis has been made. The patient is encouraged to give as full a description as he can of his state of health during this period and, if necessary, leading questions are asked. Inquiry of this kind having led us to suppose that the standard teaching we have quoted was misleading, we have examined the histories of the last 30 consecutive cases of primary pleurisy with effusion admitted.

In the selection of cases we have applied the following criteria :—

(1) That pleurisy with effusion should be the first manifestation of chest disease.

(2) That the X ray film should not reveal tuberculous infiltration of the lung.

(3) That sputum, if present, should not at any time have been found to contain tubercle bacilli.

In other words we have chosen cases of true primary pleural effusion, and have excluded cases of frank pulmonary tuberculosis complicated by pleural effusion. All have been in-patients here during the last four years and have undergone, on admission, routine questioning and examination, physical and radiological, without special reference to the subject of this inquiry.

Of our 30 cases, we found eight who presented the classical acute onset. This was characterised by a sudden attack of pleuritic pain, with dyspnœa, rapidly developing fever, and extreme general malaise. There was no history of prodromal symptoms in these cases. In ten cases the onset was subacute, and of these, seven complained of one or more of the following symptoms—pain, pleuritic or non-pleuritic, and sometimes intermittent; cough, always without sputum; and slight general malaise—the duration of these symptoms varying from one to six weeks. The remaining three subacute cases presented a painless pyrexia with no localising symptoms of any kind; the condition was discovered on routine examination after one or two weeks' fever. The largest group, 12 cases, was of insidious onset, the outstanding symptom being general malaise, the duration of which varied from 2 to 18 months, the average period being 8 months. This malaise was usually associated with slight increasing pain of non-pleuritic character. The patient usually sought relief for this pain; only in one case was dyspnœa an outstanding feature. In two cases an acute exacerbation of symptoms led to diagnosis after many months of ill-health.

These observations, as far as they go, draw attention to a point which seems to us to have been insufficiently emphasised, namely, that the onset of primary pleurisy with effusion is frequently insidious and not acute, being preceded by several months of increasing general malaise and non-pleuritic pain.

Our thanks are due to Dr. R. C. Wingfield, medical superintendent of this sanatorium, at whose suggestion this investigation was started.

KERNIG'S SIGN IN INFANTS

By Walter Broadbent, M.D. Camb., F.R.C.P. Lond.
CONSULTING PHYSICIAN TO THE ROYAL SUSSEX COUNTY HOSPITAL, BRIGHTON

In infants under a year Kernig's sign is very rarely obtainable in cases of meningitis, in children between one and two I have quite often found it not present, and in one child with tuberculous meningitis nearly three years old it could not be demonstrated. But I have always found it in children over three. It is important that its absence should not be thought to exclude meningitis.

Head-retraction may also be absent in infants. I once did a lumbar puncture on a baby of three months old who had only been ill for six hours but had had numerous convulsions. There was not the slightest sign of any rigidity of the neck or legs, but the fontanelle was bulging. The cerebro-spinal fluid was cloudy, and, in a direct film many meningococci could be seen, there being no need to make a culture. Head-retraction is an unfortunate term, as it only occurs late in cases of meningitis—in cerebro-spinal often too late for intrathecal treatment to be effective. Head-rigidity would be better. In any patient with headache or delirium the head should be pulled forward to see if the chin will touch the chest. If it will not, there is intracranial pressure, and Kernig's sign should be looked for.

FOREIGN BODIES IN THE HEART

V. A. Ugon reports the case of a man, aged 22, an agricultural labourer, who was wounded in the chest by the accidental discharge of his own revolver (Semana méd., 1935, xlii., 157). The bullet entered the right side of the thorax in the anterior axillary line, and he was taken to hospital suffering from a small right-sided hæmothorax. The symptoms, however, were disproportionately severe, with dyspnœa, tachycardia, precordial oppression, and pain radiating to the left shoulder. Radiography showed the bullet embedded in the posterior wall of the left ventricle, and electrocardiography revealed disturbance of intraventricular conduction.

Operation was done a month after the accident, preceded by induction of an artificial pneumothorax. Under a general anæsthetic the thorax was then opened by an extensive resection of the left fifth rib and its cartilage, and freeing of the fourth and third costal cartilages from the sternum. A rib-spreader was introduced, the collapsed lung was packed off, and the phrenic nerve was blocked by an injection of novocain. The pericardial sac was opened from behind, and a single adhesion to the heart broken down. The left hand was passed into the pericardial sac, and the heart pushed up into the pericardial incision. The bullet could be felt embedded in the myocardium, close to the interventricular septum. An incision was made at this point, just large enough to enable the bullet to be grasped with forceps and withdrawn. There was no bleeding, and it was thought inadvisable to introduce any sutures, for fear of including some of the conducting tissue. The incision in the pericardium was partially closed, a small aperture being left for drainage into the pleural cavity. The chest wall was closed. Convalescence was interrupted by a streptococcal pleural effusion, which was treated by a small incision and drainage, but recovery was complete, and the patient, with no symptoms and a normal electrocardiogram, was able to return to his work.

In summarising his views on the removal of foreign bodies from the wall or cavities of the heart Ugon says that if the injury is recent immediate intervention is always desirable. Sharp-pointed objects are relatively likely to give rise to subsequent trouble if left alone, and if a foreign body lies free in a cavity danger of embolism justifies an attempt to get it out.

MEDICAL SOCIETIES

MEDICAL SOCIETY OF LONDON

Lord HORDER, the president, took the chair at a meeting of this society held on March 25th, when a paper on the

Future of Diagnostic Radiology

was read by Dr. H. K. GRAHAM HODGSON. The extent of the possibilities of radiology in diagnosis depended, he said, upon the men practising the specialty. Radiology was a clinical method, and the essential prerequisite was a sound knowledge of clinical medicine. The radiologist must, if the science were to progress, equip himself with a wider basic knowledge of pathology and clinical medicine. The production of "pretty pictures" was nowadays a fairly simple matter, but the radiologist had to interpret pictures of every part of the body. He must be able to talk to every specialist in his own language with full understanding of the problems which confronted him, and must be constantly devising means to solve new problems. In a few years the teaching hospitals would expect the radiologist to possess the same high qualifications as the physician, surgeon, or pathologist. Future progress in technique, Dr. Hodgson thought, would follow two main lines: an increasingly accurate rendering of anatomical detail by means of telerontgenography and a widening of the scope of contrast media. For purely geometrical reasons a picture taken with the tube 6½ or more feet away was a more faithful representation of the object than if the tube were only 30 inches away. As, however, the rays lost their intensity in proportion to the square of the distance, a very heavy current was needed, heavier than the present-day tube would stand. The difficulty had been overcome by the production in Germany and Holland of a tube with a rotating anode, a disc on which were mounted six small focal spots. The energy was thus distributed over a number of foci and far greater power could be used. Radiography with the tube at a distance had already been employed for some years in chest work but was bound in future to embrace every part of the body.

Thorotrast, a preparation of thorium dioxide, was now successfully used for outlining blood-vessels and thereby for the diagnosis, among other conditions, of cerebral tumour. Given in amounts under 10 c.cm. it was harmless. Intravenous pyelography would reveal conditions in the kidney and ureter which had hitherto escaped notice; Dr. Hodgson showed films illustrating how spasm of a ureter and urinary stasis could cause a pressure in the renal pelvis greater than in the glomeruli and tubules, thereby producing a dense homogeneous opacity. Berg, Akerlund, Kirklin, and others had greatly advanced the study of the intestinal tract by their method of administering small quantities of thick barium fluid and palpating it over the rugæ of the mucosa; and by draining off a barium enema and inflating the colon with air. Dr. Hodgson, however, doubted whether the use of a non-absorbable heavy metal gave a really true picture of conditions in the tract, and looked forward to an absorbable contrast medium which would be mixed with ordinary food. Fruitful results would, he predicted, be obtained by a more general use of the laws of gravity. The erect posture was the normal posture; intensifying screens and high-power apparatus had made possible extremely short exposures for all parts of the body, and motor-driven tilting tables made it possible to move the patient quickly into any position. There was no longer, therefore, any need to adhere to the prone and supine positions when the erect would be preferable. A weight-bearing joint should be examined in the weight-bearing posture, and even the fœtus in utero would have a more everyday expression if the mother were upright. The behaviour of fluid levels in different postures was often informative, especially in the sinuses. Mysterious shadows in the region of the gall-bladder could often be elucidated by taking films in two or three different postures. The technique devised by Prof. Blair-Bell might be utilised for impregnating metastatic deposits and thereby rendering them radio-opaque.

The time was not far distant when television would be applied to X rays. Two specialists could then examine and discuss a film at a distance from one another, but a greater advantage would be the possibility of increasing the brightness of the screen image without using a stronger screening current. It would then be possible to take cinematograph records of the screen over a much longer period than at present and the difficulty of obtaining detail in moving pictures would be overcome. Nevertheless, even to-day cineradiography had opened up a new and useful field of research. Though it could not supplant the screen examination of the stomach, with palpation, it was an actual record of the movement of the organ. A cinematograph film was an invaluable means of estimating the progress of disease or treatment and of instructing students.

Dr. RUSSELL REYNOLDS, who demonstrated some of his films of the heart and lung in normal and diseased persons, said that he had now taken records of some 300 subjects, in the departments of orthopædics, the thorax, the heart, and the gastro-intestinal tract. Much was being learnt about the function of the stomach in health and disease. The film negative was printed on to a short length of positive, the ends of which were joined to form a continuous band; by this means the cycle of movement could be studied at leisure in a manner which was impossible on the screen, where the radiologist had not sufficient time to concentrate on all the points which called for his attention. Once the apparatus had been purchased the method was cheap, for 50 feet of 16 mm. film could be bought for 6*s*. 6*d*. Work was in progress on films of the heart which would also show a synchronised electrocardiographic record. The direct method of cine-radiography might give better details, but the apparatus was cumbersome and the expense was prohibitive.

Dr. T. F. TIERNLEY declared that the radiologist was so anxious to be a good clinician that he was apt to neglect the technical side of his work. Technically some hospital radiography was very bad indeed, and films taken with the most modern apparatus compared unfavourably with some of the pictures of thirty years ago. In the present teaching of the radiologist stress was laid on academic physics, which would not help the student to understand how a motor or a generator worked. No attention was paid to radiography, and the radiologist could obtain a diploma without ever having screened a stomach and without the first notion of how to take a film of the finger.

Dr. A. C. SHANKS remarked that the joints still constituted a "silent area" in the field of contrast radiography. Air had been injected unsuccessfully

and various contrast media with disastrous results. He looked forward to an intravenous preparation that would outline the capsule. The present difficulty of following the movement of the cardiac shadow in a cinematograph film would be overcome when Dr. Russell Reynolds and his colleagues produced a slow-motion record.

Dr. PETER KERLEY, in vindication of the Cambridge diploma in radiology, stated that the course was nine months, during three months of which students were trained in technique. Apparatus was at their disposal and they were obliged to do a minimum of thirty hours' technical work. They must spend three months at least in the radiographic department of a teaching hospital and submit radiographs of cases. The technical side of their education was therefore reasonably well covered.

The PRESIDENT agreed with Dr. Hodgson that the nearer the radiologist stuck to physiology in his contrast media, the more would his colleagues be helped by the interpretation of his results. He should study the conditions of his waiting-room and operating-room in order to reduce disturbance to the nervous system of his patients.

LIVERPOOL MEDICAL INSTITUTION AND MANCHESTER MEDICAL SOCIETY

AT a joint meeting held at Liverpool on March 7th, with Dr. C. O. STALLYBRASS in the chair, Mr. JOHN MORLEY (Manchester) read a paper on

Diverticulosis and Diverticulitis of the Duodenum and Colon

After describing the morbid anatomy of duodenal diverticula of the common acquired type, Mr. Morley gave details of six cases, on four of which he had operated. Five of the six patients had other lesions (gastric ulcers 2, duodenal ulcer 1, gall-stones 2) which were more probably the cause of their pain than the diverticula. From his own cases and larger series of reported cases Mr. Morley concluded that duodenal diverticula do not as a rule produce definite symptoms unless either unusually large or grossly inflamed. Diverticulosis of the colon he attributes to forcing, by the normal mass peristalsis of the colon, of small herniæ of mucosa through the vascular gaps in the muscle coat of the bowel. He believed that the areas of rigid bowel wall presenting the jagged, saw-edge radiological picture described by Spriggs and Marxer as the "prediverticular state" are really due to an interstitial inflammatory lesion that is secondary to early diverticulosis. In discussing the pathology of acute and chronic diverticulitis of the colon, he pointed out that the histological features of the latter placed it in a group of lesions described in the recent German and American literature as non-specific granulomata of the intestine. Mr. Morley analysed a series of 37 cases of diverticulitis of the colon, 16 of which were acute and 19 chronic. The main difficulties of diagnosis were, he said, to distinguish acute diverticulitis from acute appendicitis, and chronic diverticulitis from carcinoma of the colon. Where a colo-vesical fistula formed, the probability was strongly in favour of diverticulitis rather than carcinoma. As to treatment in acute perforative diverticulitis diffuse peritonitis demanded immediate surgical intervention, while a localised abscess required a more conservative attitude. In chronic diverticulitis the treatment was generally medical, and operation was only called for when symptoms of chronic intestinal obstruction arose that would not yield to conservative measures. Radical excision was rarely feasible; colostomy well above the point of obstruction had to be performed.

In the discussion which followed, Mr. J. B. OLDHAM said that as an enthusiastic user of spinal anæsthesia he had frequently noted that when segments of the pelvic colon were in spasm the mucous membrane bulged through the muscular coat as a string of tiny blebs in the lines in which diverticula occurred. Everyone recognised that diverticulosis was infinitely commoner in the pelvic colon than elsewhere, but he wondered if Mr. Morley could confirm his (Mr. Oldham's) experience that after the pelvic colon, the region of the hepatic flexure was the commonest site for the condition.

Dr. S. W. PATTERSON agreed that pathological conditions of stomach and gall-bladder, such as peptic ulcer and gall-stones, were often associated with duodenal diverticula. The diverticula could develop to a large size without producing symptoms; but in about one-fourth of the cases symptoms did occur, in the absence of any associated lesion. In regard to the nomenclature of the various X ray appearances of diverticula of the colon, the palisade appearance was produced by inflammatory processes (diverticulitis). In a series of cases observed over years it had been possible to demonstrate a prediverticular state, characterised by rigidity of the bowel wall and interference with peristalsis, at areas which later showed diverticulosis.

Dr. R. E. ROBERTS said that he agreed that the unexpected X ray finding of duodenal diverticula sometimes tended to distract attention from other less obvious lesions in the region of the duodenum and gall-bladder, the symptoms being attributable to such lesions rather than to the more obvious diverticula. He was interested in the possibility of intestinal diverticula giving rise to toxæmia from absorption of infective products from food stagnating in diverticula of the colon. He quoted one case in which a severe and intractable sciatica completely disappeared after the X ray finding of extensive diverticulosis of the colon, which was then treated by liquid paraffin and guaiacol carbonate. Dr. Roberts felt sceptical about the attribution of the saw-like, spiky, or palisade appearance of the colon to a prediverticular condition; he had found similar appearances in the presence of ulcerative colitis, and in carcinomatosis and sarcomatosis of the peritoneum. In the differential diagnosis between simple and malignant stricture of the colon the presence of multiple diverticula, shown in a barium meal or enema examination, might be misleading if they were regarded as evidence in favour of simplicity of the stricture.

Dr. N. KLETZ (Manchester) read a paper on

Functional Digestive Disorders

He said that this term implied cases in which there was actual digestive dysfunction, though no organic cause. The term was not synonymous with "neurotic." These were real disorders which caused real incapacity and suffering. A most important contribution to the knowledge of digestive disorders had been the realisation of the importance of the musculature and the nervous mechanisms which controlled it and modified it. The symptoms produced in functional digestive disorders were not in themselves different from those produced by local organic disease, which they might closely mimic, and their differentiation was most important.

Dr. S. BARTON HALL advocated a closer study of the relation between constitutional types and the types of disordered digestive function, suggesting that the factor of constitutional idiosyncrasy was of almost equal importance to that of scientific dietetic principle.

REVIEWS AND NOTICES OF BOOKS

Physiology in Health and Disease

By CARL J. WIGGERS, M.D., Professor of Physiology in the School of Medicine of Western Reserve University, Cleveland, Ohio. London: Henry Kimpton. 1935. Pp. 1156. 42*s*.

MOST of the standard text-books of physiology, with which we in this country are familiar, have attained their present form by a process of evolution over many years. We have become accustomed to a traditional mode of treatment, and view any departure from it with mixed feelings. Prof. Wiggers has brought to physiology a mind intent on presenting the subject as it stands to-day, with a minimum of reference to its infant vicissitudes, and the result is a business-like work with many original features. The chapters are short, the style crisp and to the point, but there is no pandering to ignorance; the reader must have his wits about him, and if he is a student must be prepared to supplement the text by discussions with his teachers and reference to his laboratory work. The object of the economy of expression is not to summarise, but rather to make room for more material; the book contains "a large supplementary volume of information which, even if never mastered or remembered, nevertheless proves valuable for reference in particular fields of medicine and of physiology." It abounds with citations of original papers, mostly modern, and the reader is frequently referred to other works for detailed treatment of a subject or in order to form his own opinion upon a disputed point. Nearly all the illustrations are either quite original or from modern sources, and optical records have replaced the familiar white tracing on smoked paper.

At last we see the complete abandonment of the anatomical treatment of the nervous system, with the result that a vast amount of available physiological material has been introduced and systematised. The diagrams illustrating irradiation of reflexes are excellent in conception, but their execution might be made less formidable than at present. The question of the function of the cerebellum is courageously tackled, and the light of common sense thrown upon the numerous facts relating to it. The aura of mystery which tends to cling to the autonomic system is dispersed by including its reflexes in the general discussion of reflex action, while its special function is treated in a separate section on the coördination of visceral functions which includes a survey of hormonic activity. Other examples of the readjustment of emphasis are not lacking, but space allows of reference to but one other—namely, the subservience of the sections on lymph, cerebro-spinal fluid, intra-ocular fluid, œdema, and the secretion of urine, to the general question of water metabolism and transport. The most exhaustively treated and copiously illustrated section of the book is that dealing with the circulation, the author's own field of research. Biochemistry and the details of the special senses receive scant attention, on the plea that they are adequately treated elsewhere. As is suggested by the title, a good deal of space is devoted to the perversions of physiological function met with in the wards. Nearly every chapter has its clinical bearing discussed, and many are entirely devoted to clinical conditions such as anæmia, acidosis, anoxæmia, dyspnœa, and cardiac lesions. There is no flirting with empiricism here, however, and the various conditions are approached from the strictly scientific point of view and elucidated as far as possible in the light of modern physiological knowledge.

There is no doubt about the merits of the book, but the plan of making it a volume for general reference as well as a fresh exposition of physiology has its drawbacks. In places the book is not very readable; in others the very conciseness may mislead the novice. For more advanced students of physiology or of medicine, however, its value is considerable, and given constant revision it is assured of a permanent place among the text-books of pure and applied physiology.

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1. Handbook of Gynæcology

Third edition. By BETHEL SOLOMONS, B.A., M.D. Dub., F.R.C.P.I., F.C.O.G., M.R.I.A., late Master, Rotunda Hospital, Dublin. London: Baillière, Tindall and Cox. 1934. Pp. 368. 15*s*.

2. Synopsis of Obstetrics and Gynæcology

Sixth edition. By ALECK W. BOURNE, M.B., B.Chir. Camb., F.R.C.S. Eng., Senior Obstetric Surgeon, Queen Charlotte's Hospital; Obstetric Surgeon, St. Mary's Hospital, London. Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall Ltd. 1935. Pp. 444. 15*s*.

1. Prof. Solomons has always held that students of gynæcology require a small book to help them in their practical work; he confesses, however, that he has had considerable difficulty in resisting the temptation to lengthen every chapter of this manual. Its best feature, in our view, is the detailed exposition, both in text and illustration, of the examination of the pelvic organs, with especial reference to the use and misuse of instruments as aids to this investigation. The chapter on the disorders of menstruation includes advice to young women concerning the monthly period; we agree with most of it, but feel that "floor polishing" as a remedial exercise for dysmenorrhœa will hardly commend itself to the patient. Thirty pages of this small book are devoted to displacements; it is to be hoped that the effect of this emphasis will be counteracted by the reminder that displacements may cause no symptoms, and that the patient need not be informed of their existence. Nearly one-fourth part of this work is given over to the use of gynæcological instruments and operations. In contrast the pathology and treatment of such common and aggravating conditions as pruritus vulvæ and backache are disposed of in a few lines. In the next edition some reallocation of space will be necessary.

2. No further proof is required of the popularity and usefulness of this synopsis of obstetrics and gynæcology than the fact that it has reached a sixth edition. It is clear that to a certain type of academic mind a synopsis of any medical subject is an anathema; but that such a volume as this is of the greatest help to the student with an overburdened curriculum, and to the practitioner who wishes rapidly to refresh his mind, is indisputable. The essentials of the pathology, symptoms, and physical signs of each condition are here given in tabular form. The section on treatment is full, adequate, and eminently practical. An account of the physiology of the sex hormones and a description of the obscure and dangerous condition of obstetric shock have been included in this edition.

Mr. Bourne makes it clear that the synopsis should be used only for purposes of reference. The addition of a short bibliography to direct further reading would be welcome.

Treatment of Common Female Ailments

Third edition. By FREDERICK JOHN MCCANN, M.D. Edin., F.R.C.S. Eng., F.C.O.G., M.R.C.P. Lond., Consulting Surgeon, Samaritan Free Hospital for Women. London: Edward Arnold and Co. 1934. Pp. 380. 12*s.* 6*d.*

THIS work is essentially practical. The text is a record of Dr. McCann's personal observation and experience, and all reference to authorities has been omitted. Throughout the book the value of the preventive aspect receives repeated stress. The third edition contains new chapters on methods of examination, the endocrine glands, the climacteric, injuries to the pelvic floor, fertility, and sterility. An additional chapter describes in detail the treatment of patients before and after operations upon the pelvic organs. Certain information here supplied is not to be found in the majority of gynæcological text-books, as for instance a full discussion of various methods of contraceptive technique. The subject of marriage in relation to health and disease is dealt with on common-sense lines. The carefully worded statement of the advice to be given to patients in the treatment of their condition constitutes the most useful feature of the work.

Handbook of Therapeutics

Second edition. By DAVID CAMPBELL, M.D., F.R.F.P.S., Regius Professor of Therapeutics, University of Aberdeen. Edinburgh: E. and S. Livingstone. 1934. Pp. 444. 12*s.* 6*d.*

THIS handbook of therapeutics begins with chapters on nursing, prescribing, modes of administration of medicines, dietetic and physical methods. These chapters provide information and advice not often found in such text-books and often neglected by the student; they are admirably written and show an excellent critical outlook. The rest of the book follows customary lines, most medical diseases being discussed in order. Full emphasis is laid upon prevention, and alternative methods of treatment are impartially included. The author's experience and judgment are manifest throughout the book. His own experience makes him sceptical of current practice in certain respects, and he explains his position clearly, condemning without hesitation what he has found to be dangerous.

Students will be grateful for the clear and concise teaching, and practitioners will find in it much to help them in their daily routine.

Practical Talks on Heart Disease

By GEORGE L. CARLISLE, M.D., Associate Professor of Clinical Medicine, Baylor University, Dallas, Texas. London: Baillière, Tindall and Cox. 1934. Pp. 153. 9*s.*

WE agree with Prof. Carlisle that the difficulties of diagnosing and treating heart disease are very commonly exaggerated. Disorders of the heart are in the main straightforward lesions easy to recognise, and their management presents fewer problems and pitfalls than do disorders of other vital organs. This book is full of useful and wise material. Accessory methods of examination such as electrocardiograms and X ray are shown to be unnecessary in a large proportion of cases although admittedly essential in a few. The book is divided into six sections. The first sets out the fundamental facts which should be grasped before clinical examination is undertaken. The distinction between the neurotic and the patient with organic disease is well drawn and the observation that heart disease does not produce symptoms "around the heart" is worth remembering. In the discussion of breathlessness the need to discuss what the patient understands by "shortness of breath" is emphasised in order to separate the symptom from such spurious conditions as sighing respiration. Considerable importance is here assigned to the determination of the position of the apex-beat as a guide to the size of the heart; many clinicians, especially those who attempt to confirm their findings by routine X ray examination, now regard this as the most unreliable part of a clinical examination. Prof. Carlisle himself regards as the most important part of his message that diagnosis must not be made on one symptom alone, and most, if not all, modern cardiologists will agree with him.

The sections on chronic and acute heart disease are adequate; in the section on heart pain the author notes that mostly physical examination yields entirely negative results and reliance has to be placed on the history alone. The last section of the book on cardiac neuroses is the most helpful of all, as so many cases met with in practice fall into this category and prove troublesome to manage.

Especially to those practitioners who were taught cardiology many years ago this book will be valuable as a bridge between the old and the new dogma.

Text-book of Pathology

Second edition. Edited by E. T. BELL, M.D., Professor of Pathology in the University of Minnesota, Minneapolis, U.S.A. Contributors: E. T. BELL, B. J. CLAWSON, M.D., HAL DOWNEY, Ph.D., J. S. MCCARTNEY, M.D., and C. J. WATSON, M.D. London: Henry Kimpton. 1935. Pp. 767. 37*s.* 6*d.*

THE first edition of this text-book was notable for its brevity; it was if anything too summary in its treatment of an important subject. Pathology cannot profitably be passed over in a brief and superficial manner; some deep and rather heavy reading is necessary to give a true and lasting appreciation of the principles involved. In this edition each contributor has added extensively to his various sections, but though there are 140 more pages, and the work now approaches the average length of a text-book of pathology, the additions are chiefly in the nature of further observations, and add little to the depth of the work. The matter is chiefly confined to bare facts and observations, with little space given to discussion. At the same time, it must be admitted that the book is a triumph of compactness, is excellently written, and unusually well illustrated. Each section is provided with a list of references, and these have been considerably increased in the second edition. The order of the special pathology part is somewhat unusual, in that it opens with gynæcological pathology, thus bringing into prominence a section which in most general text-books takes a less important place. Headings are prominent and well arranged, and the whole of the reading matter is set out in an agreeable manner. Of the soundness of the teaching, the distinguished names on the list of contributors are a sufficient guarantee.

1. American Medicine

By Dr. HENRY E. SIGERIST, William H. Welch Professor of the History of Medicine, Johns Hopkins University. Translated by HILDEGARD NAGEL. London: Humphrey Milford, Oxford University Press. 1934. Pp. 316. 16*s*.

2. F. J. Shepherd—Surgeon

His Life and Times. By WILLIAM BOYMAN HOWELL. London: J. M. Dent and Sons, Ltd. 1935. Pp. 251. 12*s*. 6*d*.

3. All in the Day's Work

Leaves from a Doctor's Case Book. By ABRAHAM GROVES, M.D., formerly Medical Superintendent of the Royal Alexandra Hospital (now the Groves Memorial Hospital), Fergus, Ont. With a Foreword by AMBROSE LORNE LOCKWOOD, D.S.O., M.C., M.D. Toronto: The Macmillan Company of Canada, Ltd. 1934. Pp. 181. $3.00.

THERE is growing up an extensive literature in America and Canada in illustration of the practice of medicine at different dates and in different localities through the medium of estimates, personal recollections, and biographies of prominent practitioners. These books, apart from the interest excited in many readers for personal reasons, have a wide message as forming footnotes to the history of medicine. When we see what was found by men highly esteemed in their generation to be the things that mattered in their practice, we can appreciate with real clearness the onward march of medicine and its increasing value to society. The first of the three volumes reviewed below is a résumé of American medical history. The subjects of the other two volumes were both born in the middle of last century, and the record of experiences recorded in both cases is brought up to date, the old and the new being linked up in their work.

1. Dr. Sigerist, in previous books, has shown his ability to interest us in past leaders of our profession and to tell the story in a clear and sympathetic manner. The volume now before us, in the production of which he acknowledges the assistance of Dr. Fielding Garrison and Dr. Rathbone Oliver, is a résumé of the events marking the rise and progress of medicine in America. A note on such healing art as was exhibited among the Indian tribes is followed by a description of the development of medicine in colonial times, when we learn that even before the American Revolution many colonists felt that the institutions which they had themselves founded sufficed for their needs, and that the journey to London, Edinburgh, and Paris, undertaken by the more ambitious, was unnecessary. We in this country are apt to forget how old some of the great American foundations are. At this point a picturesque sketch of general American history is interpolated, introducing such prominent pioneers of medicine in the U.S.A. as John Morgan, Benjamin Rush, Ephraim McDowell, Samuel David Gross, and James Marion Sims, bringing the record up to the period when Oliver Wendell Holmes, Weir Mitchell, and Shaw Billings were the best known figures. The section devoted to pioneers closes with an estimate of the work of Osler and Welch, leaving the development of American hospitals and nursing institutions, and the rise of a definite ethical system, to be dealt with later. This is done in a notably complete manner considering the space allotted to the subjects, while the evolution of medical education in the States is told in considerable detail. Here an interesting tabular statement reflects on a method by which American students can obtain British qualifications before graduation in their own country, and it is indicated that considerable abuse may lie behind any facility of this sort granted to the immigrants. An epilogue with which this interesting study terminates promises a future volume dealing with the outlook of medicine in Russia, an understanding of what is projected and done in Russia being considered by the author necessary to follow the actual course of modern medicine.

2. Francis Shepherd's professional career began in 1869 when eleven general practitioners who composed the medical faculty of McGill received the students and subjected them to a matriculation examination of extreme simplicity, which had, however, the merit that very few medical faculties in the United States and in Canada had at the time any entrance examinations at all. McGill possessed one of the most highly standardised curriculums, and the medical course consisted of four six-months sessions, one of which could be evaded by producing a certificate of a year's apprenticeship to a medical practitioner. The education was given by professors who moved from chair to chair, and the clinical training was carried on at Montreal General Hospital. Each attending member of the staff looked after surgical cases as well as medical, a procedure of which Osler once said: "The physic of the men who were really surgeons was better than the surgery of the men who were really physicians; which is the best that can be said of a very bad arrangement." Introduced to medicine in this manner, Shepherd graduated at McGill in 1873, and then did a long course of post-graduate work in London and on the Continent, notably Vienna. In London he entered the medical school of St. Thomas's Hospital, and took the English double diploma in 1874. He returned to Montreal in the autumn of the following year, and for the next half-century was associated with the progress of scientific surgery in Canada. We gather from this brief life of him that he was courageous and industrious, and also that he was a brilliant surgeon and an independent thinker.

3. Abraham Groves graduated from the Toronto medical school in 1871, and this book consists of notes recording his doings or his views from the period when he entered practice in that year to that when he finally retired, more than 60 years later. The articles which make up the book are arranged in three groups: in the first are described his early operating feats; in the second part we have his views reprinted from medical journals or transactions of medical societies, and providing an interesting sketch of the rise and progress of surgery; while the third part is composed of a miscellaneous set of articles on such subjects as health schools and the standardisation of hospitals. All three sections are written in a clear and modest manner, but it is not until the date of the surgical exploits is observed that we realise what a veritable pioneer in surgery Abraham Groves of Fergus was. In 1874, when only three years qualified, he performed a successful operation for the removal of an ovarian tumour, and had the extraordinary foresight to boil everything which was to be employed at the operation. He was the first surgeon in Canada to operate by abdominal section for appendicitis. How a man with such exploits to his credit failed to obtain a university chair in surgery, and an environment in which he could develop his great gifts is certainly curious, but there is nothing to show that he was other than satisfied to remain the centre of surgical activity in a modest district.

THE LANCET

LONDON: SATURDAY, MARCH 30, 1935

TREATMENT OF ASPHYXIA NEONATORUM

WHILE it may be untrue to say that diagnosis is nowadays regarded as less important than formerly, there are signs that the word is taking on a somewhat different shade of meaning. We are inclined to lay less emphasis on the classification of a disease than on a thorough understanding of its processes, and signs and symptoms are regarded less as pieces of a puzzle, which should fit together into some recognised pattern, than as clues which may aid us to visualise the difficulties under which some physiological activity of the body is labouring. Rational treatment arrived at in this way may of course be frustrated by the presence of irreparable damage, but there is one kind of patient at least to whom this should seldom apply—namely, the new-born infant. In the newly born, if a deranged physiological process can be understood and corrected, there is every probability that the treatment will be immediately and permanently successful. It is therefore of paramount importance that the measures in vogue for the management of such an accident as asphyxia neonatorum should be continually scrutinised from the theoretical standpoint.

In the Goulstonian lectures, concluded in our last issue, Dr. ALAN MONCRIEFF draws much-needed attention to recent developments in this subject, the investigation of which has hitherto been prosecuted with less vigour in this country than elsewhere. His classification of the possible causes of respiratory failure in the new-born as either central or peripheral clears the ground; and it is noteworthy that the number of sub-headings in these two classes is much less than in the corresponding classes relating to the adult. Four descriptions, indeed, cover the majority of cases. The centre may be embarrassed by increased intracranial pressure, or by an abnormal distribution of the gases of the blood, while aeration of the blood in the lungs may be prevented by debris in the respiratory passages, or by the child's inability to exert an inspiratory force sufficient to open up, for the first time, the closely folded alveoli. It is shown that, except in extreme cases, each of these conditions can be corrected by suitable treatment, and that the choice of treatment is not too difficult. In a paper published in our present issue Mr. J. B. BLAIKLEY and Mr. G. F. GIBBERD direct our notice especially to initial delayed expansion of the lungs, and they join with Dr. MONCRIEFF in a categorical condemnation of all methods of artificial respiration which involve the least violence to the child. Universal realisation of the harm done by vigorous but all too simple forms of treatment would do more than anything to stimulate interest in, and establish, the gentler methods advocated by these authors. The active phase of normal respiration is inspiration, expiration depending on the elasticity of the lungs; but in the adult artificial respiration may be successfully maintained by forcibly compressing the chest wall and relying on its passive return to a normal shape to draw air into the lungs—exactly the opposite sequence. Clearly this principle is more often than not quite useless in the new-born child, since its lungs contain no air which can be forced out, and short of using apparatus of some sort, the problem of causing actual expansion of the lungs is well-nigh insuperable. BLAIKLEY and GIBBERD and MONCRIEFF discuss the use and misuse of simple apparatus, both in this connexion and for administering oxygen and carbon dioxide when respiratory movements are already present.

The value of Dr. MONCRIEFF's approach to the subject is further seen in his explanation of what underlies the clinical appearance of "blue" and "white" asphyxia. The fact that, as far as respiration is concerned, these are different manifestations of one and the same thing is important, for it enables the really essential point in treatment—the supplying of oxygen to the tissues—to be clearly focused. Not only does oxygen-lack result from the absence of respiratory movements, but by damage to the centre it may prevent their initiation; and this vicious circle must be broken. Oxygen itself does not act as an actual respiratory stimulant and must be given mixed with carbon dioxide. Whether this gas is of any importance apart from its excitatory effect upon the respiratory centre is a matter of dispute; YANDELL HENDERSON, for instance, states that it is, and advocates its administration in fairly high concentration. Whether this is necessary or not, the modern recognition of its usefulness in certain forms of asphyxia ranks in importance with the growing realisation of the dangers of anoxæmia, even if only moderate in degree, when continued for any length of time. Respiratory failure is of the highest importance at whatever age it occurs, and the newer knowledge of its treatment needs to be spread as soon and as widely as possible.

SAFEGUARDING ANÆSTHESIA

THE elaboration of anæsthetic apparatus and the replacement of simple methods by others requiring complicated machinery have served two purposes. They have helped in the perfect fulfilment of the surgeon's requirements during operation, and they have improved the patient's condition after the operation. But the help and the improvement have only been gained at a price, and progress cannot be held to be complete until the necessity of paying this price is removed. To the anæsthetist the greatest gain has undoubtedly been the removal of the bugbear of overdose. In former days this was avoided, if at all, by constant care and watchfulness. The machines, however, which have made overdose almost impossible have introduced two dangers of a new kind: explosion and faulty assembling of apparatus.

The danger from explosion is bound up with the substitution of ether and other inflammable

vapours for the non-inflammable chloroform, and the increasing use in the operating theatre of electric motors and the electrical illumination of body cavities. The risk from the explosion of ether vapour in various mixtures was fully explored some years ago by Mr. J. D. MORGAN, D.Sc., after a fatal accident in an operating theatre at Birmingham, when an explosion occurred in the patient's mouth and was transmitted along the rubber tube to the anæsthetic apparatus. That ether vapour might ignite at so low a temperature as 190° C. was already well known, but Dr. MORGAN suggested that when contaminated by impurities ether might ignite at a temperature as low as that of boiling water. He stated that the mixture of ether obtained when air or oxygen was passing through the chloroform bottle of a Shipway apparatus was one approaching the maximum degree of inflammability, and actually the risk of explosion which existed while the patient was receiving chloroform was far greater than when ether was being administered. That was, he said, because the outlet of the ether bottle was always open to the delivery pipe, and ether vapour was free to pass to this pipe by either diffusion or suction. Dr. MORGAN arrived at two conclusions: (1) that no electrical apparatus capable of giving a free spark or even exposing a hot surface should be inserted into the mouth while ether was being administered; (2) that the Shipway apparatus should be fitted with a cock which closed the outlet from the ether bottle when air or oxygen was diverted to the chloroform bottle. No doubt the lessons of this case have been taken well to heart elsewhere, but with the introduction of new anæsthetic vapours and new methods of apparatus constant watchfulness is required. Moreover recently it has been demonstrated that static electricity is, even in this country, not the negligible factor in anæsthetic explosion which we here have hitherto held it to be. The joint committee of the Medical Research Council and the anæsthetics section of the Royal Society of Medicine, of which Dr. J. BLOMFIELD is chairman, is keeping closely in touch with the origin of these accidents and the measures necessary for their prevention, utilising the experience gained from the popularity of various gaseous anæsthetics in the United States of America.

The danger that arises from faulty fitting up of the anæsthetic machine has been made unhappily familiar in the use of chloroform from a Junker inhaler. There were times when an administrator, momentarily forgetful of the golden rule never to use an apparatus without first trying it, pumped liquid chloroform into the patient's throat. Some years ago we illustrated (1928, ii., 1359) various forms of Junker bottle designed to make this accident impossible, and pointed out (ibid., p. 1352) that there was no excuse for any institution or anæsthetist who elected to use a Junker which was not fool-proof in this respect. That kind of accident has now, it seems, virtually disappeared, but recently a fatal accident occurred due to the bellows being fitted to the wrong tube when ether was the drug in use, and this, we are glad to see, has led to a review of the whole position by the Surgical Instrument Manufacturers' Association, a letter from whom appears in our correspondence columns. It may well be that when the devices there recommended are in general use there will be an end to accidents due solely to faulty fitting up of anæsthetic apparatus which includes some form of driving force. This does not mean that the responsibility of the anæsthetist has been diminished or the onus shifted from his shoulders to those of the instrument maker. A heavy responsibility rests on every medical man who has to procure in the patient and to maintain in him a condition of full surgical anæsthesia as it is understood to-day. Machines may be standardised and made fool-proof, but patients cannot. Indeed, the care and skill demanded of the anæsthetist who is using a machine, let us say for the administration of nitrous oxide or ethylene or cyclopropane, are not less but more than those demanded of his predecessor with a drop-bottle and an open mask.

LABORATORY EVALUATION OF SURGICAL ANTISEPTICS

THE distinction between the value of antiseptics outside and inside the body and the factors which tend to diminish their effective action in living cavities or organs was discussed at the odontological section of the Royal Society of Medicine on March 25th. Prof. ALEXANDER FLEMING described experiments showing that antiseptics do not reach the apex of a narrow crevice, and do not adequately penetrate tissue or other organised material. Most disinfectants, flavine being a notable exception, were, he said, much reduced in activity by albuminous material. This "quenching" effect was strikingly illustrated by experiments with some of the new mercury compounds, the activity of merthiolate in the presence of blood being only one-thousandth of that exhibited in broth. Another disadvantage, most marked in the case of dyes, was affinity for the material of dressings, which absorbed and thus removed them from their intended sphere of action. The method of testing antiseptics advocated by Prof. FLEMING is, broadly, to make a mixture of fresh blood with a small quantity of bacteria; an antiseptic in various dilutions is added and the mixture is placed in slide-cells and incubated. The surviving bacteria grow into visible colonies which can be counted. Prof. FLEMING holds that an antiseptic to be used within the body should be tested in the presence of fresh blood in order that its effect on leucocytes can be observed as well as that on bacteria: examples of such tests, he said, showed that a wide range of concentrations of antiseptic have no other effect than to destroy leucocytes, and thus permit the growth of more bacteria than survive in a control mixture containing no antiseptic at all. The clinical application of antiseptics could have other effects than the destruction of bacteria; one of these was an increased transudation of fluid from the infected tissues. In subsequent discussion Dr. L. P. GARROD raised the crucial question whether surgeons—general or dental—are prepared to

accept the results of laboratory tests as any guide to the choice of antiseptics; at present such tests are commonly ignored or discounted in practice. He instanced iodoform and mercurochrome as antiseptics which have been condemned by laboratory evidence but are still widely used. The method of testing proposed by Prof. FLEMING gave results, according to DR. GARROD, which suggested that all antiseptics did more harm than good, and for the conditions which the method was designed to imitate this conclusion might well be correct. But there remained the possibility of destroying bacteria in a wound before tissue invasion had taken place; it had been shown repeatedly by animal experiment that this was possible with flavine. Dr. GARROD considered that a test in which blood was used merely as a hindrance to bactericidal action might serve to assess the merits of surgical antiseptics in intelligible and comparable terms. Subsequent speakers appeared ready to accept a series of conclusions which were certainly negative and may even have appeared cynical.

Prof. FLEMING'S plea for the introduction of a generally recognised method of testing surgical antiseptics is fully justified by the present confusion in this department of medicine. The observation that no adequate accounts of antiseptics and their powers and limitations are included in most surgical text-books leads to the question whether existing knowledge on this subject is really capable of coördination into any authoritative statement. Such conclusions as could be brought together in such a statement have been obtained by the use of endless different methods, the results of which are mostly not comparable. It is clear that either antiseptics must continue to be judged largely by their clinical effects, a matter which among the almost infinite variety of situations and infections to which they are applied is not easy, or else a method of laboratory evaluation must be devised which will be appropriate, exact, and generally acceptable.

MEDICAL SERVICES IN THE ARMY

A RECENT discussion in the House of Commons on the army estimates gave the Financial Secretary of the War Office the opportunity of reviewing the medical services in the army. These, he said, covered in some form or other the whole of human activities. The purview of the War Office extended from the midwife to the undertaker and ranged over all the periods of life between; they provided nurses, doctors, teachers and chaplains; they fed, clothed and housed many thousands of persons in all kinds of climates. To provide all these services he was asking this year for a vote of £950,000. No one, he thought, would dispute the necessity for the provision of medical attention to the troops, but few people realised that the R.A.M.C. had its special problems in peace no less than in war. The distribution of troops in overseas garrisons under widely variant geographic and climatic conditions called for specialised medical knowledge beyond that which was ordinarily attainable at home, and behind the day-to-day medical supervision there was going on a careful research into medical problems peculiar to the army. Research of this kind had in the past been of untold value to the surrounding civil population. In the case of undulant fever, for centuries an endemic disease of Malta, the discovery of the cause and therewith the means of prevention was entirely the work of the R.A.M.C. Research of like importance was now going on into antityphoid inoculation. When the activities of this great health service came to be more fully investigated by the public they would, he felt sure, form a very different idea of its value not only to the Army but to humanity at large. For some time there had been a disconcerting lack of candidates for commissions in the R.A.M.C., partly, no doubt, due to financial considerations which were receiving attention. Conditions of service had already been materially improved, promotion had been hastened and the period necessary to qualify for a gratuity on retirement had been reduced. It was now, he said, possible for an officer to take a short-service commission for five years and then retire with a gratuity of £1000 if he was not appointed to a permanent commission. The service should now attract young men on qualification. The life was interesting and there was plenty of opportunity for specialisation by those who were keen on study and research. Mr. HACKING concluded his survey with the remark that he was confident that were the work of the R.A.M.C. better known there would be a still wider field of selection of candidates.

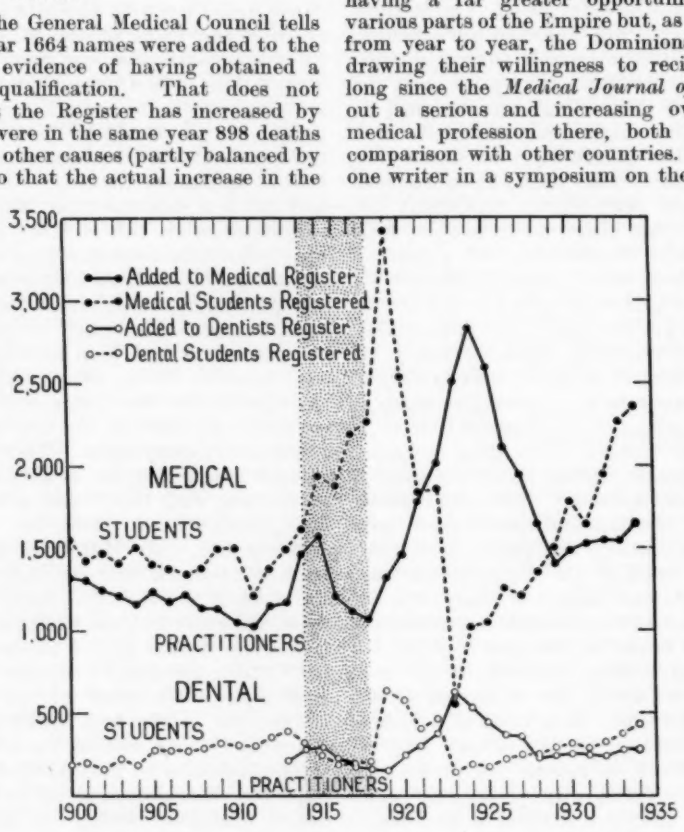
In the debate Sir ARNOLD WILSON deplored the state of many of the barracks abroad, emphasised the need of further welfare work among the wives and children of soldiers, and asked that dental care in the army should be raised to the standard of that available in civil life. He regretted the dropping of antimalarial work in certain stations owing to financial stringency, remarking that in India they were spending only 11½*d*. a head on antimalarial work compared with £1 15*s*. 4*d*. spent in the Panama Canal zone. The result was that malaria had been a greater scourge in 1933 than in the previous years. Sir FRANCIS FREMANTLE congratulated the Government on having put into force many of the recommendations of the Warren-Fisher Committee with the result that since June of last year 40 medical recruits had been taken into the army medical service, the largest number since the war. But the difficulty of ensuring permanent promotion still remained in spite of the increase from 113 to 155 in special posts. He warmly endorsed Sir A. Wilson's plea for improvement of married quarters and hoped it would be only the beginning of a general clean-up right through the garrisons of the Empire.

A FORTNIGHT ago we announced in these columns two generous donations to radium research under the auspices of the Medical Research Council, the Department of Scientific and Industrial Research and the Royal Colleges with the loan of radium element from the Belgian supply. This research work is being carried out at the Radium Institute in Portland-place. The patients are housed and maintained by the Institute, which also provides certain staff services as its contribution towards the cost.

ANNOTATIONS

THE PORTAL OF MEDICINE: AN INCREASING ENTRY[1]

THE Registrar of the General Medical Council tells us that during last year 1664 names were added to the Medical Register on evidence of having obtained a registrable medical qualification. That does not of course mean that the Register has increased by that number; there were in the same year 898 deaths and 61 removals from other causes (partly balanced by 50 names restored), so that the actual increase in the number of names on the Register was 755, bringing up the total to 57,496—a figure which may be compared with 44,761 in 1920 and 40,483 in 1910. It should be noted that the number of new qualifications has risen steadily since 1929, and is 40 per cent. above the entry which seemed to meet requirements in pre-war days. During and shortly after the war the oscillations marked the varying needs of the moment, but now there is a definite tendency for the figure to settle down at a level which would at one time have been considered more than ample. If it is argued that the number may again diminish within the next few years in accordance with some law of supply and demand, attention should be paid to the entry of medical students from which can be formed a rough forecast of the number of qualifications six or seven years hence. The Registrar tells us that last year 2350 men and women registered as medical students with the Council, a number which is without parallel save in the altogether exceptional years 1919 and 1920—and it should be remembered that these figures are understated for registration of students is not obligatory. From all sides have come warnings of an overcrowding and overcrowded medical profession. A decade or more ago Switzerland reviewed its own situation and took drastic measures to ensure that the entry should be brought down, notably by the refusal of facilities for foreigners to practise. Switzerland has of course no colonies of its own to take the overflow of highly educated people, but within the last three or four years France which has this safety valve has come to the conclusion, on the evidence of a commission appointed by the Academy of Medicine for the purpose, that overcrowding is serious. France also proposes still further to restrict the already severe difficulties placed in the way of foreigners. There was to be a partial exception for Rumanians. Germany under the new régime has been more drastic than this. Britain is peculiar in having a far greater opportunity for practice in various parts of the Empire but, as the Register records from year to year, the Dominions are steadily withdrawing their willingness to reciprocate. It is not long since the *Medical Journal of Australia* pointed out a serious and increasing overcrowding of the medical profession there, both absolutely and by comparison with other countries. "No doubt," said one writer in a symposium on the future of medicine as a profession, "competition is a good thing in moderation, but too much can only act detrimentally by developing the economic and commercial side to an unpleasant degree," and he predicted that present medical students would suffer semi-idleness during the best years of their lives.



The facts in the situation are not set down with alarmist intention but in the hope that the position will be considered by the General Medical Council when they again meet. They are in the best position to know to what extent the circumstances of our times, with the great expansion of opportunities for all kinds of public service, justify so large an entry, and to what extent there is good reason for the qualms felt by the late President of the Council when the entry of qualified men and women was so large a dozen years ago. The situation then was not menacing in like degree, for as clearly appears in the graphic picture, now brought up to date, the entry of students was at that time in inverse ratio to the qualified entry, whereas now the two are running parallel. The position of dentistry is quite different, for the small increase in numbers both of students and practitioners must be welcomed in view of the fact that many more will be required to fill up the places of the 1911 practitioners, many of whom were admitted to the Dentists Register at a comparatively advanced age.

[1] The Medical Register for 1935 (21*s.*); the Medical and Dental Students Register for 1934 (7*s.* 6*d.*); the Dentists Register for 1935 (12*s.*): all published for the General Medical Council by Constable and Co., Ltd.

IS CHRONIC PROGRESSIVE POLYARTHRITIS AN INFECTION?

Dr. Gunnar Kahlmeter, who is in charge of the Åsö Hospital in Stockholm and known beyond the Scandinavian countries for his work on rheumatism, has recently[1] set out to answer this question in the light of the blood changes associated with the disease. In so doing he is bold enough to pit the value of the intensive study of isolated cases against the mass

[1] Nord. med. tidsk., Feb. 2nd, 1935, p. 161.

statistics now in vogue. Though his own conclusions are based on a statistical analysis of hundreds of cases, he is critical of the analysis, mostly from American sources, of cases terminating in recovery after the removal of alleged foci of disease. These figures are, he remarks, based on the erroneous assumption that no patient can recover unless foci are removed. Study of insured persons suffering in Sweden from chronic progressive polyarthritis has satisfied Dr. Kahlmeter that about 60 per cent. of them recovered their capacity for work under ordinary institutional treatment; long before the doctrine of focal infection was successfully launched, his patients were muddling their way through to recovery. No doubt recovery may hinge on the removal of an infectious focus. When, as happens in many cases, its removal has no noticeable effect on the disease, it may be that it has extended so far that the original peccant focus no longer plays an important part, or that constitutional and other factors prevent recovery. Dr. Kahlmeter's conclusions are based on blood sedimentation-rate, percentage of hæmoglobin, numbers of erythrocytes, and absolute and comparative numbers of leucocytes. The blood, taken from the capillaries in the fasting state, was examined by one and the same person. With these figures before him, Dr. Kahlmeter is doubtful if infection alone can be held responsible for the disease. An infectious factor is, however, demonstrable in so high proportion of cases that it is impossible not to hold it responsible for playing a dominant rôle in many cases. He compares the genesis of polyarthritis with that of asthma, remarking how in both many different influences or exciting factors may produce one and the same clinical picture. The clinical uniformity of chronic progressive polyarthritis may conceal the interplay of multiform causes.

POST-VACCINAL ENCEPHALITIS

THE February issue of the *Bulletin* of the International Office of Public Health contains a survey of the incidence and fatality of post-vaccinal encephalitis in certain countries during the last two years. In England from September, 1933, to October, 1934, four cases with three deaths after primary vaccination were reported in persons aged 4, 6, 7, and 18 years. The symptoms in each case developed on the thirteenth or fourteenth day after vaccination. There was one mild case in a lad aged 19 following revaccination. In Germany in 1933 there were fourteen cases with one death following primary vaccination and five cases with two deaths after revaccination. In the first six months of 1934 there were three cases with one death after primary vaccination and two cases with one death after revaccination. In the United States in 1933, in addition to five cases in children aged from 3 to 9 years which occurred from eleven to nineteen days after primary vaccination, there were three cases about which there were no details. In Holland eight cases were notified in 1933; three of these were rejected after examination by the official neurologists, who also regarded some of the remaining five as doubtful. As the number of vaccinations performed during the year was 26,000, the average proportion of one case to every 5000 vaccinations remained the same. In the first six months of 1934, when 10,000 vaccinations were performed, two cases were reported. In Norway twenty-eight cases with eleven deaths were reported during the period 1930–33. Of eighteen children who had been vaccinated before or after 1930 and had survived the complication, seventeen had completely recovered and only one still had paralysis. In Sweden no fatal cases had occurred since 1932, and there were only three mild cases in 1934. The number of annual vaccinations remains about the same in this country. In Belgium, where about 100,000 vaccinations are performed yearly, there was only one case—in a girl aged 12 years, who developed the first symptoms on the twelfth day after vaccination and died after a few days' illness. There were no cases in British India.

THE NEW UNIVERSITY HOSPITAL IN JERUSALEM

Dr. J. J. Golub, who has been invited to select a site in Jerusalem for the Rothschild-Hadassah University Hospital, is making some stay in London en route for Palestine. Dr. Golub is director of the Hospital for Joint Diseases in New York City, and is serving as consultant in the planning of the new hospital and of the attached Nathan Ratnoff medical school. They will be built on Mount Scopus adjoining the Hebrew University to which the hospital is affiliated for post-graduate teaching and research in hygiene, bacteriology, biochemistry, parasitology, general pathology, and cancer. The hospital is to have 250 beds and an out-patient department capable of dealing with 144 patients an hour. There will be a visiting staff of at least 36 specialists, and quarters are being arranged for 20 residents. A special emergency service will provide ambulances to work over the whole of Jerusalem and bring patients to the nearest available hospital. A special feature of the Rothschild-Hadassah Hospital will be a private and semi-private floor of 14 beds serving the growing needs of foreign visitors to Jerusalem. This section of the hospital will be referred to as the American Hospital in Palestine. At present Palestine has only about three hospital beds per thousand of population, including those provided by the Government and various missionary bodies.

NEUROGRAMS

AN extension of the method of radiological definition by the injection of substances opaque to X rays has recently been described by Dr. Makoto Saito,[1] of Nagoya, Japan. He and his co-workers have proceeded from the successful use of lipiodol in the visualisation of blood-vessels, and of thorotrast in that of lymph-vessels to experiments in neurography. The ulnar nerve, being the only one that is readily reached by subcutaneous injection without exposure, was used for injection experiments on the intact nerve. Thorotrast was found more suitable than lipiodol, mainly because it flowed further along the nerves. By subcutaneous injection of 0·5 c.cm. of thorotrast into the ulnar nerve, where it lies in its groove behind the elbow, clearly defined shadows of 7 cm. to 39 cm. of the length of the nerve were obtained. The neurograms were taken twenty-four hours, two days, and three days from the time of injection, and the central spread of the solution was clearly demonstrated. In one case, three days after the injection, 24 cm. of the nerve were visible on the film, stretching from the point of injection to the axillary fossa; towards the periphery the shadow stretched for 4 cm. only. The form of the shadow may be linear, wavy, or denticulate; in some cases the nerve-fibres show up distinct from the neurolemma and in one film it is even possible to recognise the internal leaf of the neurolemma, consisting of fibres running parallel with the nerve, from the obliquely running fibres of the external leaf. Saito describes the neurograms obtained in nerve lesions, and in a case of multiple neuromata, where the nerve is

[1] Amer. Jour. Surg., 1934, xxvi., 300.

caught in a cicatrix or projection of callus, its deformity and a failure of the spread of the opaque substance can be demonstrated. After neurolysis, recovery of the nerve is shown by the gradually increasing length of the shadow in the X ray. Clinically, this change in the radiological picture occurs pari passu with the recovery of nerve function. Disturbance of central spread has been the main feature of nerve lesions, as demonstrated in radiograms taken before and after operations on the ulnar, radial, and peroneal nerves. Perineuritis, according to Saito, produces a knotty defect in the shadow. Some interesting pictures were obtained in the case of multiple neuromata, showing the varying relation of the tumours to the nerve trunks—a relation that was subsequently verified by operation. The only objection to the use of thorotrast seems to be the extreme slowness of its absorption; in fact, there seems no proof that it is finally absorbed from the substance of the nerve. It appears, however, to be clinically inert, and its presence gives rise neither to pain nor paresis along the area of nerve distribution or at the site of injection.

MUSIC AND MEDICINE

THE time has come when the profession as a whole, we feel, might devote more study to music; for its effect upon our patients, for both good and evil, is very potent. The use of music was encouraged by physicians of classical times and in the Middle Ages on account of its beneficial action upon mind and body; this subject was studied in considerable detail some years ago by Dr. Agnes Savill in an interesting book, "Music, Health and Character." As a profession we should endeavour, for the sake of the health of the people, to ensure that the original object of the "alternative programme" scheme of the B.B.C. is adhered to—namely, that on one of the programmes good music should always be obtainable, so that our patients may be soothed towards the evening hours. An unpretentious little volume[1] of Dr. Keith Barry is written with the aim of being a guide to musical understanding. It is addressed to those who "listen in" and switch off when good music is on the air, believing they cannot understand it. Simple explanations are given concerning the different instruments of the military band, chamber music, and the modern orchestra; the meaning of the nomenclature used in musical compositions is dealt with briefly: such as adagio, andante, &c.; the elements of the sonata, concerto, and symphony; and the ignorant are told how to listen in order to obtain the most pleasure and benefit. The book reads as if it were a series of lectures; its matter could with advantage be drawn together and presented more systematically; but its very simplicity and brevity may induce those who believe they dislike good music to listen until their prejudices are conquered.

SUPPLY OF INTERNATIONAL VITAMIN STANDARDS

WE are asked to announce that the international standards for vitamins A, B_1, C, and D, to which reference was made in a leading article last week, are now available for issue to laboratories, institutions, and research workers in Great Britain and Northern Ireland. These standards are kept at the National Institute for Medical Research, London, which acts for this purpose as central laboratory on behalf of the Health Organisation of the League of Nations. The required quantities of each of the vitamin standards are now being sent to national central laboratories for subsequent local distribution in countries abroad. The National Institute for Medical Research will continue to supply the international vitamin standards for use in Great Britain and Northern Ireland. The standards for the vitamins B_1 and D remain unchanged and their supply at regular half-yearly intervals will be continued as before. The standard for vitamin A has been changed, a pure specimen of β-carotene having been adopted in place of the impure preparation of carotene hitherto employed. The unit of vitamin A remains unchanged, though it is now defined as the vitamin-A activity contained in 0·6 microgramme of pure β-carotene. In accordance with the recommendations of the Second International Conference on Vitamin Standardisation the β-carotene is issued in the form of a solution in oil, of which 1 gramme contains 500 International Units. The quantity of this standard solution supplied to each applicant is approximately 5 grammes, and, on account of the small quantity available, it can be supplied only at yearly intervals, and not half-yearly as formerly. It is suggested, therefore, that care and economy should be exercised in its use and that subsidiary laboratory standards, exactly assayed in terms of the international standard, should be prepared for routine work. *l*-Ascorbic acid has been adopted as the international standard for vitamin C, the unit of activity being defined as the vitamin-C activity contained in 0·05 milligramme of pure *l*-ascorbic acid. A quantity of approximately 550 milligrammes will be supplied to all laboratories, institutions, and research workers in Great Britain and Northern Ireland who require it.

It is suggested that those laboratories, institutions, and research workers in Great Britain and Northern Ireland who do not receive the standards at present, and who desire to receive any or all of them, will apply to the Director of the Department of Biological Standards, The National Institute for Medical Research, Hampstead, London, N.W.3.

CENTENARY OF ST. MARK'S HOSPITAL

THE Lord Mayor of London, Sir Stephen Killik, presided on March 21st at the 99th annual meeting of the governors and supporters of St. Mark's Hospital, City-road. His lordship gave a brief sketch of the development of the hospital from small beginnings until, at the dawn of its 100th year, it had developed into a centre for treatment of wide reputation. This, he said, justified the authorities of the hospital in appealing for £60,000 needed to meet the heavy demands now made upon its services. He recalled to the audience that on St. Mark's Day, April 25th, the centenary banquet, in support of the funds of the hospital, would be held at the Mansion House when he would have the pleasure of presiding—a well-deserved compliment to a great charity which had its origin in the City within a few yards of the centre.

Contemporary with the centenary celebrations the medical committee of St. Mark's Hospital have selected and produced in a sumptuous volume[1] a series of papers written by surgeons to the hospital and contributed to medical literature. These papers range over a period commensurate with the existence of the institution and form a running commentary on the operative side of proctology for a century. The first essay was contributed by Frederick Salmon, the founder of the hospital, to THE LANCET in 1831, two years before the hospital existed; he was at that time senior surgeon to the Aldersgate General Dispensary, and his paper was an excellent plea for intensive

[1] Music and the Listener. By Keith Barry, M.B., Ch.M. Melbourne: Robertson and Mullins Ltd. 1934. Pp. 126. 2*s*. 6*d*.

[1] Collected Papers of St. Mark's Hospital, London, 1835–1935.

and special study of all rectal disease. The next paper describes Salmon's operation for internal hæmorrhoids and is written by that distinguished proctologist William Allingham. In this paper, which appeared in 1888 in Allingham's well-known text-book on "Diseases of the Rectum," Salmon's original operation, devised and practised at the opening of the hospital, is fully described. At the other chronological end we have a paper by Mr. E. T. C. Milligan and Mr. Naunton Morgan on the surgical anatomy of the anal canal, with special reference to anorectal fistulæ (vide THE LANCET, Nov. 24th, 1934, p. 1150, and Dec. 1st, p. 1213), and between the extremes we have a number of contributions from past and present members of the staff of the hospital, among whom are Alfred Cooper, David Goodsall, Swinford Edwards, who still fortunately is with us, and Herbert Allingham, a brilliant surgeon who died tragically young, when already in the front rank of general surgeons, but who had begun his career by following his father William Allingham's specialty. The papers are preceded by a historical sketch of the institution, illustrated by a portrait of Frederick Salmon and pictures of the hospital in its first home in Aldersgate-street, and its second home on its present site, with views of the newer buildings and of the wards and out-patient department. One notes in this historical sketch the remarkable fidelity of members of the honorary staff to the institution. Salmon, the founder, worked at the hospital for 24 years, Alfred Cooper for 34, David Goodsall for 33, Peter Gowlland, the elder Allingham, Swinford Edwards, Gordon-Watson, and Lockhart-Mummery all for more than twenty years. Sir Charles Gordon-Watson remains as consulting surgeon, while Mr. Lockhart-Mummery, though resigning his position on the regular staff, will continue to serve for a period as emeritus surgeon.

The volume was formally presented to the Lord Mayor at the close of the annual meeting.

EXPERIMENTAL ANÆMIA

UP to date it has proved extremely difficult to produce a megalocytic anæmia in animals by an experimental procedure. Such an anæmia has been produced in dogs by causing stenosis of the small intestine, and in young pigs by a diet of corn, fish-meal, and draff. Quite recently D. K. Miller and C. P. Rhoads,[1] feeding swine a diet which will cause black-tongue in dogs, have produced a characteristic symptom-complex. The principal manifestations were anæmia, which was often megalocytic, lesions of the oral mucous membrane, achlorhydria, and motor weakness of the extremities. When the disease was present it was impossible to demonstrate hæmopoietic activity of the gastric secretion or liver when tested on cases of pernicious anæmia in man, though both the liver and gastric juice of healthy pigs were hæmopoietically active. The disease syndrome of swine could be prevented and alleviated by the administration of certain substances, such as liver extracts which are prophylactic and curative of sprue, tropical megalocytic anæmia, pellagra, and pernicious anæmia in man. The authors found the similarity between this experimental disease of swine and a group of pathological states of human beings to be striking, and to justify the inference that in man the pathological changes are due, in part at least, to a common cause, and that the cause is basically a lack of intake or utilisation of some as yet poorly defined dietary constituent. It is not yet clear exactly what essential factor is absent from the diet used in these experiments. As far as rats were concerned, the vitamin-B complex appeared adequate; it may be possible that the requirements of pigs for this vitamin are different. A diet adequate in every respect but vitamin B will not produce black-tongue however, so presumably it was not deficiency of this complex that caused the symptoms. Nor is there any evidence that a lack of any mineral constituent was involved, since liver extract, which is exceedingly low in minerals, will cure or prevent the disease syndrome. Even in those cases where the anæmia which developed was of the microcytic type iron was without effect, while liver extract was curative. The nature of the missing factor is not yet obvious, but it is a matter of considerable importance that by an unknown dietary deficiency it is possible to produce within a period of weeks not only megalocytic anæmia, but also profound changes in gastric secretion.

[1] Jour. Clin. Invest., 1935, xiv., 153.

THE CRICKET ON THE HEARTH AGAIN

WHATEVER the cause, whether it be Keats for calling the "cricket's song" to witness that the "poetry of earth is never dead," or merely Milton and his "cricket on the hearth," there is no doubt that the cricket has held a position of respect in the English household enjoyed by few other insects. But in an age which finds little time for poetry, and which is becoming less and less tolerant of "little inmates," however "full of mirth" they may be, the cricket is finding itself in the same class as the universally detested cockroach. Gilbert White, it is true, while writing of the cockroach, which was something of a novelty to him in 1790, in terms of kindly interest, refers to crickets as "noisome pests" which "often gnaw holes in wet woollen stockings and aprons that are hung to the fire." He notes that they delight in new-built houses, and that is so to-day: it is chiefly the inmates of newly erected council houses who complain that they are overrun with crickets. The reason for this is not certain, but in many cases it is less because the crickets are "pleased with the moisture of the walls . . . and the softness of the mortar" than because such houses are often built close to old refuse dumps where uncrushed tins in a warm environment provide perfect nurseries for crickets. They are not, as a rule, difficult insects to eliminate. The Curate of Selborne explains that they "may be blasted and destroyed by gunpowder discharged into their crevices and crannies"; but in a less violent age they can be poisoned with a bait of equal parts of bran, treacle, and sodium fluoride, flavoured, perhaps, with a little beer.

SCIENCE AND SERVICE

IT must happen that details of scientific work, when given with the elaboration which is necessary, seem to obscure the very reason for their publication. Many a one will have asked, while glancing through columns describing technical work that is outside his own sphere, how is all this of practical service to me in my daily work? To the notice of any who have felt like that, we commend the beautiful speech of Mlle Eva Curie, whose words will be found as she spoke them in a report of the dinner held on Wednesday, March 20th, in support of the British Memorial to Marie Curie (see p. 760). The physics and chemistry of radium, when under discussion from any aspect, entail the publication of details that can only be comprehensible to workers upon certain scientific fields. If such details are not published those workers cannot obtain the intercommunication which is so valuable for progress. But as these labourers in the special field are able to

provide their colleagues engaged in clinical research and practice with new weapons against disease, the value of the purely scientific investigations emerges and we see the connexion established between science and service. Madame Curie's life was a personal demonstration of that connexion, as her daughter showed in her moving tribute. "Things, not persons," she said from her laboratory, but she came to devote herself to the relief of humanity.

CARDIOLOGY AND PSYCHOLOGY

THE moral drawn from Dr. G. E. S. Ward's address to the Medical Society of Individual Psychology on March 14th was a moral familiar on paper but often forgotten in practice. In his study of cardiology, he said, he had always been impressed by the supreme importance of the patient's state of mind. Great good can come from a suggested optimism, and fear plays so sinister a part in many cases that considerable reticence is necessary in giving information. The murmur, for example, is too often treated as a bogy by the medical man and, through him, by its owner. In sinus arrhythmia, again, every care should be taken to allay apprehension, and needless to say, attention must not be drawn to the abnormality if it has escaped notice. Premature systole is another cause of shaken morale, and the business of the physician is to persuade the patient of its unimportance. It is significant that cardiac cases usually take anæsthetics well; the sense of dread is lost with unconsciousness and the action of the heart is quietened. "It may not be fair to lie to a patient," said Dr. Ward, "but it should be remembered that a bad prognosis may be wrong and its immediate effect might be fatal." In no condition is the psychological factor more evident than in angina pectoris, and in this disease sedatives are more useful than stimulants. A firm attitude is necessary with people whose troubles are functional but who insist on the gravity of their disorders, but the most difficult case of all is that of organic lesion with an added functional disturbance. This state of affairs is exceedingly common, not only in cardiac cases but in those with hypertension, and reassurance with the establishment of mental calm is vastly more important than attempts to reduce blood pressure by drugs of uncertain action.

COMPARABILITY OF MATERNAL MORTALITY-RATES

A QUESTION put by Sir Francis Fremantle to the Ministry of Health (see p. 786) shows how vexed is the question of the comparability of maternal mortality-rates in different countries. An inquiry by the Children's Bureau of the U.S. Department of Labour was no doubt in part provoked by the apparently high rates recorded in recent years in the United States. The procedure adopted by Dr. Elizabeth Tandy, who was in charge of the study and has now completed her report[1] was, briefly, (1) the selection of a random sample of the deaths in the U.S.A. associated with pregnancy and childbirth in 1927, and (2) the submission of this sample to the statistical offices of as many countries as could be prevailed upon to make a tabulation by assigning the deaths to the puerperal or non-puerperal group according to their own rules of tabulation. This task was carried out in sixteen countries, and the variability found is considerable. For instance, in the United States themselves 92·9 per cent. of the deaths were tabulated to puerperal causes, whereas the proportion was only 78·7 in England and Wales, and as much as 99·4 in Denmark. In the majority of the countries a smaller number of deaths would be assigned to the puerperal state than in the U.S.A., so that relatively the rates in the latter country are overstated. These differences in methods of assignment are, however, found to be insufficient to explain entirely the higher maternal mortality-rate of the United States. Their official figure, which in the last few years has exceeded that of every country except Scotland, remains high no matter what method of assignment is used. For instance, the English tabulation reduces the United States' rate from 6·5 per 1000 live births in 1927 to 5·5, while the rate of England and Wales in that year was only 4·1. Differences in the definition of live births, and a possible incompleteness of birth registration, are not sufficient to account for the remaining excess, and such factors as social and economic conditions, racial types, and provision for maternal welfare must be invoked. The provisional figures for 1934, just issued by the Registrar-General (see p. 774), show a further slight rise in the puerperal death-rate for England and Wales. The increase in puerperal sepsis is appreciable, but there has been some fall in the rate from other causes.

[1] Children's Bureau Publication, No. 229. Pp. 24. 5 cents.

MALARIA IN KRK, RAB, AND PAG

WITHIN recent years the islands of the Adriatic, many of which have long been intensely malarious, have afforded a demonstration of the value of larva-eating fish in the control of malaria. Recently the three islands off the coast of Yugoslavia, Krk, Rab, and Pag, formed the subject of a report by Dr. O. Trausmiller, of the Institute of Hygiene in Zagreb, to the International Health Office. In these islands *Anopheles maculipennis* is the main, if not the sole carrier of malaria. In the island of Krk, the only source of water supply is rain water stored in cisterns or in shallow ponds or "lokva," and these constitute the primary source of malaria. The introduction of the larvivorous fish gambusia, in 1924, resulted in a striking fall in the disease. Since the economic depression the fish have died out in many of those ponds which periodically become dry; but it is proposed henceforth to put the onus of restocking such ponds upon the farmers themselves. In Rab there are many natural springs creating innumerable breeding places for *A. maculipennis*, and here quininisation is the chief measure used. But in Pag, gambusia has proved even more successful than anticipated, eliminating *A. maculipennis* not only in the "lovka" but in the large lakes which are the chief source of danger in the plains.

ERGOTOCIN

THE almost simultaneous discovery of the same substance in two places far apart is a fairly common experience in medicine. We commented last week on the isolation of ergometrine by H. W. Dudley and Chassar Moir, and now find that a group of workers from the University of Chicago[1] have published a preliminary report of a new active principle in ergot which stimulates the contractions of the puerperal uterus when given by the mouth.[1] Kymographic tracings show the contractions recorded by means of the uterine bag method. The substance, which has been isolated in crystalline form, is being prepared in large quantities by the Eli Lilly Company under the name of "ergotocin." It would be premature to conclude that two substances are identical pending an exchange of material between the two groups of workers.

[1] Davis, M. E., Adair, F. L., Rogers, G., Kharasch, M. S., and Legault, R. R.: Amer. Jour. of Obst. and Gyn., Feb., 1935, p. 155.

PROGNOSIS

A Series of Signed Articles contributed by invitation

XLV.—PROGNOSIS IN CHRONIC PULMONARY TUBERCULOSIS

II

(*Concluded from p. 693*)

PROGNOSIS is really inseparable from diagnosis and treatment. This is particularly so with chronic pulmonary tuberculosis. If the exact state of the patient is not diagnosed accurately a correct view of the prognosis will only be arrived at by a fluke. Chief amongst the factors upon which the prognosis depends when symptoms of active pulmonary tuberculosis have developed are: the age, the economic position, the temperament and psychological make-up of the patient, the amount and nature of the disease and of the constitutional reaction, and the degree of skill shown in treatment. It is easy to lay down certain rules which are helpful up to a certain point in forming an opinion as to the prognosis, such as that young persons are more liable to get acute disease than older ones; that those who have no tubercle bacilli in their sputum, or who lose those they had, are more likely to recover; that those who are afebrile at the outset of their illness will do better than those who are feverish; that those who have the advantage of institutional treatment, especially nowadays when a good deal depends upon appropriate and well-timed collapse therapy, will do better than those who have not this advantage; that those who are sensible and determined and free from harassing mental perturbations will get on better than those without these qualifications, and so forth. The value of such information is supported by statistics, and it is necessary to take cognisance of all these points in order to arrive at a correct prognosis. Several of these were elaborated last week, and here I shall emphasise those which in my experience have proved the most important in prognosis: (1) the psychological factors; (2) the effect of collapse therapy of the appropriate kind and at the appropriate time; and (3) the assessment of the condition of the lungs in so far as the presence or absence of cavities is concerned, and their nature if present.

MENTAL FACTORS

I have placed the mental factors first because in these days of the so-called "active" treatment the tendency is to confine treatment in an institution too much to the attempts to rectify a diseased organ, as if our patients were broken-down motor-cars. Other considerations, such as familial conditioning and domestic disharmonies as factors influencing recovery, are apt to be completely overlooked. A patient may get rid of symptoms and make an apparently sound recovery; yet if he returns to bad economic circumstances or to troublesome mental irritations destroying equanimity he is almost sure to relapse. Someone who has got well may become ill again through disappointment in a serious love affair, or through having a mate who is entirely unsympathetic towards the restrictions which may still be imposed on an ex-invalid. One reason why those who can go back to some regular work, even if they have more or less to crawl back to it, do better than others is because they are in a better position than others to fight through all kinds of mental perturbations.

COLLAPSE TREATMENT

The outlook of the patient very often depends upon the application of appropriate collapse treatment. Despite the immense advances made in radiology, enabling an ever more precise estimate of the physical extent and condition of the lung lesions to be made, no treatment and no prognosis must be based solely upon these physical findings. A careful study of the history and symptoms must also be taken into account before the degree of toxæmia and the response of the individual can be estimated, and the state of the activity of the various lesions be determined. The developments which have followed artificial pneumothorax have enlarged the scope and enhanced the remedial value of collapse therapy. That is why more precise knowledge of the state of the lungs must be properly utilised. Many authorities have published statistics to show how pneumothorax treatment has brought a higher rate of recovery. One of the latest comes from the pen of Dr. Peter W. Edwards (Public Health, 1934, xlvii., 255) showing 65–93 per cent. alive in Class II. cases compared to only 28 per cent. alive in the controls for whom it was not possible to induce an artificial pneumothorax; and 31–81 per cent. in Class III. against only 8 per cent. alive (after three to nine years in all cases) in the controls. But these figures deal only with simple artificial pneumothorax cases, or with such combined with a phrenic operation. For some patients more complicated procedures are advisable, and if appropriately undertaken they enhance the recovery-rate. J. Gravesen and P. V. Benjamin, in the 1932 report of the Vejlefjord Sanatorium, have shown what collapse therapy combined in recent years with sanocrysin has done to improve recovery-rates by taking the percentage of bacillus-free patients on discharge as a criterion of improvement. By dividing many hundreds of cases into five-year groups and comparing the earlier results with the later they have shown that the percentage attaining improvement in this respect was more than doubled in Stage III. patients in the 1926–30 period as compared with the 1901–05 period. Only 16 per cent. of 509 Stage III. cases with tubercle bacilli in the sputum treated during 1901–05 by the then available methods lost the bacilli; whereas 33 per cent. of 387 similar patients treated by the more modern methods of 1926–30 became free from bacilli. Comparing 628 patients with T.B. in sputum but in all stages of the disease in the sanatorium during the 1901–05 period with 476 in the 1926–30 period, they found 24 per cent. of the former became T.B. negative and 40·5 per cent. of the latter. Bearing in mind that the patients for whom more elaborate procedures than simple artificial pneumothorax become necessary usually constitute a worse class of case, their figures indicate, too, how the developments of pneumothorax treatment have improved the prognosis. Thus of 1687 T.B. positive Stage III. patients treated by sanatorium régime alone 19 per cent. became free from tubercle bacilli during the whole period 1901–30; whereas of 483 T.B. positive Stage III. patients treated during the same period, also by artificial pneumothorax treatment (with thoracoplasty), 38 per cent. became T.B. negative; and of 933 similar patients treated also by artificial pneumothorax, operations, and sanocrysin, 35 per cent. became T.B.

negative. Of 170 treated by thoracoplasty alone 34 per cent. became free from bacilli.

CAVITIES

To arrive at a correct prognosis much attention must be given to the presence or absence of cavities and as to their nature if present. More than 40 years ago it was recognised that excavation went with a bad prognosis. But it was also recognised that occasionally a patient with a well-marked cavity or cavities lived a long time. To-day radiology not only enables the previously unsuspected cavity to be detected in many patients, but it also enables a fairly correct idea to be formed of the kind of cavities present and their approximate duration. Such conclusions are of the greatest importance in aiding accurate prognosis, as well as the choice of appropriate treatment. Cavities can best be classified according to the nature of the surrounding lesions as judged by radiological examination and by a study of the history and symptoms. By this means the age and kind of cavity can be more accurately gauged than by relying solely upon such criteria as its size and shape, and the nature of its wall. To get as precise an idea as possible of the sort of cavity present, and of its influence upon prognosis, it is desirable to try to estimate (1) the amount, if any, of the inflationary factor (air under pressure) which has contributed to the formation of the cavity; and (2) the degree of patency between the inside of the cavity and the bronchial system. In this connexion particular attention must be given to the secretion in and from the cavity. If there is evidence, for example, that the cavity is permanently shut off from the bronchi it is as a rule less pernicious and more likely to heal. If a cavity occurs in the exudative type of lesion, and there is evidence that the element of inflation has entered into its formation, then such a cavity may heal by enforcing strict rest upon the patient, without resort to any of the methods of compression, and sometimes, other things being favourable, in a comparatively short time. Such cavities usually have thin walls. They will sometimes disappear in from 9–18 months, or if small even in a shorter time. But older cavities and ones connected with productive or fibrotic lesions are more difficult to heal, require more time, and generally a sanatorium régime must be reinforced by more "active" treatment. If a patient with a recent cavity of the first type recovers the recovery can be complete and permanent. This result is more difficult to reach in the case of patients with cavities in lesions of the productive and fibrotic type.

The knowledge which enables us to classify cavities is by no means complete, but it is increasing rapidly. Unfortunately cavities do not always conform precisely to one group. Transition forms occur, and that makes prognosis (and treatment) more difficult. In every case, it must be reiterated, not only must the kind of cavity and the estimate of its probable duration be taken into account, but also the symptoms present and the lesions which may exist in other parts of the lung or lungs. Despite all recent advances much dependence must still be placed upon accurate temperature readings, upon the pulse-rate and tension, upon body-weight, and upon the sputum's character and content. It is well to remember that (1) unaided nature generally permits the invalid to live longer than the physician expects, though really natural healthy conditions are difficult to find in this distracted, poverty-stricken world; (2) though the application of mechanical methods of treatment with the object of repairing diseased organs often aid recovery very much, they also sometimes shorten life; (3) there is still much truth in the late Samuel Gee's aphorism: Never attempt to forecast the probable duration of life in a case of phthisis; in this connexion there is only one thing that is sure, and that is that if you do you will be wrong.

S. VERE PEARSON, M.D., M.R.C.P.,
Physician to the Mundesley Sanatorium.

SPECIAL ARTICLES

BRITISH MEMORIAL TO MARIE CURIE

A BANQUET was held on Wednesday, March 20th, at Claridge's Hotel, London, by the supporters of the British Memorial to Marie Curie, the Chancellor of the Exchequer presiding.

After the loyal toasts, Mr. Neville Chamberlain proposed the memory of Marie Curie, saying that the object of this gathering was to provide funds for the Marie Curie Hospital, Hampstead, devoted to the treatment of cancer in women by the use of radium and X rays. Probably, he said, because he had a wide experience of extracting contributions from an unwilling public, he had been asked to take the chair, but he was glad to be present for, first, he had always taken a deep interest in all that prevents and combats disease, and, secondly, he welcomed the opportunity of paying tribute to a great woman. Neither physical nor medical science knew national frontiers, and the benefits of great discoveries in physics and medicine were shared by the world. Mme Curie had been an original investigator and one of the benefactors of the human race. For a woman to have achieved great fame in science as an original research worker was rare, and her accomplishments would have been wonderful in any man. He had never met Mme Curie, but he thought she must have been a woman of exceptional strength of character. She married a poor Frenchman and lived and worked with him in Paris on some of the most remarkable experiments in recent physical science. He was a man of exceptional attainments and was her partner in devising the brilliant technique by which they succeeded in obtaining radium from pitchblende and determining its specific gravity. It was hardly to be realised what it must have meant to Mme Curie when their joint work was broken off, because her husband was run over in a street accident. She did not flinch, but went on with the work and continued her researches alone. The advent of the war put an end for the time being to these, but in the meantime much had been learnt about the application of radium and X rays to the cure and diagnosis of diseases and injuries. During the war Mme Curie devoted herself to public work, founded a school of radiology for nurses in France, and presented to the Radium Institute in Paris the whole of her radium salts, and later the gramme of radium that had been presented to her by the women of America. The Chancellor did not know that it ever entered her mind that her investigations might lead to the mitigation of human suffering. The possibilities of the new work were unrecognised. He could himself recall the excitement aroused by the dis-

covery of the Rontgen rays and subsequently of radium. The first time he saw radium was at a reception at his father's house, among the guests being Sir Oliver Lodge, who had in his waistcoat pocket a piece of radium. The guests were taken into a room and the lights turned out, when they saw the bombardment of a fluorescent screen with that piece of radium. In those days radium was a new idea—one learned of it that it had the property of giving forth inexhaustible supplies of energy without losing anything; but to-day it is shown to be one of the most valuable agents in the control of cancer. Mme Curie's death, he said, was probably hastened by her constant exposure to the rays of radium, which had proved itself one of the greatest boons to men.

Mlle Eva Curie, who was received with applause, began her response to the toast by regretting the absence of her sister.

"If," she said, "I were a brilliant and already well-known scientist as is my sister, Irene Curie-Joliot, who unfortunately could not come here to-night, I should feel much more entitled to speak here. But I am not a scientist, I even confess that I do not know much more about radium and its medical applications and the cure of cancer than any other woman. So I will just try to tell you, in a few words, why I admire, not only the great and beautiful work that you have accomplished at the Marie Curie Hospital, but also the spirit of this meeting of to-night, and why I believe that my mother would have appreciated and liked them.

"I lived with my mother till the last hour of her life, in great intimacy, and there is a little sentence of ten words which Marie Curie often repeated and which appears to me as a very striking illustration of her career and of her character. '*In science*,' she said, '*we should be interested in things, not persons.*' To my mother, these words meant chiefly that her own *person* was of no importance compared to the *things* to which she had devoted her life—i.e., compared to science, which she oved, and compared to the progress of human knowledge, which she served with all the strength of her intelligence. It is because she felt like that that a discovery made by another scientist would give her the same sincere joy as a discovery of her own. It is because she had a passion for knowledge, for wringing the secrets out of nature, that her mind never attached itself to what was already accomplished. Even on the last days of her life she was planning new work. And because she was interested in things, not persons, the tributes paid exclusively to her personal glory were a sort of torture to one of her extreme timidity and natural reserve. Some of those who approached her occasionally have perhaps kept only the remembrance of her attitude of resignation and of self-defence. The burden of celebrity really overwhelmed and oppressed Marie Curie, who, at the end of her too glorious life used still to say, with a soft voice: 'I am nothing but a student.' By a sort of divination you have guessed and understood all this, for, spontaneously you have paid to this modest woman the most beautiful tribute, the only tribute that she would have liked and accepted. For although this meeting is called in support of 'The British Memorial to Marie Curie,' it is not devoted to the person of my mother, to this person whom she never wanted anybody to care about. But five years ago you gave my mother's name to a beautiful and generous work, and I know how deeply she would have appreciated this. To-day, instead of celebrating only the memory of that relentless worker, instead of burying her in the grave of the past, you prolong her life in the life of a big institution, the Marie Curie Hospital, which works and develops every day. And so you make Marie Curie live in that future to which she used to give all her thoughts.

"In that simple name, the 'Marie Curie Hospital,' I see the beautiful epilogue of a sort of great fairy tale, of a fairy tale which started in 1891, the day when a young and very poor Polish student came to Paris to learn about the most abstract and severe things to which a woman ever devoted herself. And there comes the miracle: the discovery of radium, that dry and cold discovery made by the woman physicist, happened to carry in itself the most marvellous, the most human power: the power of relieving pain. And so, Marie Curie gave up her rule of life 'to be interested in things, not persons,' the day she knew that there were thousands of persons who were suffering and whom she could help. In the strangest, the most unexpected way, her scientific discovery, made in the loneliness of her little laboratory, obliged her to become interested in persons, to become human again. All the passion that she scorned to devote to the seeking of honours, of personal glory or financial advantage, she devoted to the attempt to help those who needed her, and whom she had suddenly the marvellous power to relieve. And so, it is by her pure genius as scientist, by the incredible and unexpected richness of her discovery, that the woman who had adopted such a rigid motto: 'to be interested in things, not persons,' has been brought back to the most primitive, the most feminine instinct: the instinct of bringing relief to human beings. That instinct guided her actions during all the last part of her life. During the war, when in bad physical condition, exhausted by her work and by too big responsibilities, she gave up her personal researches and undertook to fit out more than two hundred radiological cars, which, having learned how to drive trucks, she drove herself during four years to the hospitals of the French and of the Belgian front. After the war she took up again her scientific activity, but at the same time she devoted immense efforts to the practical development of radium therapy, of the treatment by radium of cancer and allied diseases. To achieve 'relieving of pain' is the most real reward that Marie Curie could receive. It is a sort of fairy tale that, besides making a great scientific discovery, a woman should have given to the world a new treatment for one of the most awful diseases. What you have done is a chapter of that tale. Marie Curie lives no more. But in a hospital which wears her name, surrounded by the trees and flowers that she liked so much, women scientists, prominent women doctors, are now using the power of radium to cure other women who need help. The patients may know neither who my mother was nor what radium is—that is part of the fairy tale. Thanks to Marie Curie and thanks to you, these patients will be relieved from their pains and often cured. The creation of hospitals like the Marie Curie Hospital was one of my mother's greatest dreams. I am happy and grateful to think that it is in England, in a great country which my mother admired and loved, that her dream has been realised."

Sir William Bragg also responded to the toast of the memory of Marie Curie, and said a chief place must be given to her work for the sick and suffering. When she arrived in Paris discoveries had been made by Becquerel, who had found that certain minerals emitted radiations that seemed to go on for ever, and Marie Curie, with her husband, had worked on the problem of these radiations. She apprehended that pitchblende contained the key to the problem, and with poor instruments she set to work to find out its secret. Bit by bit the two pulled the material to pieces, until in 1898 the great discovery had been made. When they came to London they had strange things to tell about the radiations which consisted of atoms, electrons, and penetrating rays, to which the name of X rays was given, and it was because he had heard of Mme Curie's experiments that he had returned to England. It being found that the radiations emanating from radium went on under all conditions, Sir James Dewar and he made experiments to show that radium was a continual source of heat. The memory of Mme Curie would always live, and the Marie Curie Hospital was a memorial.

The toast of the Marie Curie Hospital was proposed by Lord Macmillan, who said that it suffered from an unbalanced budget, and in this connexion no one had shown himself more able to balance budgets than the Chancellor of the Exchequer. He himself had not the

compelling power of the Chancellor, and what was given under compulsion was not given with pleasure; he had to use persuasion, but he would have doubted his own powers of moving his audience had it not been that the cause was so excellent. The Marie Curie Hospital was a monument to a great woman; it was not merely a memorial to someone who was dead, but it was a monument to service for the living. What manner of person the hospital commemorates his audience had heard in one of the most beautiful addresses he had ever listened to, and no one could have heard Mlle Eva Curie's words without being moved. Cancer, continued Lord Macmillan, was the most terrible of afflictions, and the Marie Curie Hospital was conducted mainly for its treatment and the mitigation of its pains. The hospital was in its sixth year and had established itself as one of our most beneficent institutions. Beginning with 25 beds, a further 5 were added, and gradually a few more until there were 39 beds for the treatment of women who are suffering from cancer. From this hospital there might come one of the greatest triumphs of humanity—that of the conquering of cancer, which still baffled medical science. Surely, he said, no institution was more worthy of their help. Since its opening over 2000 patients had been treated and more than 2000 out-patients had received consultations. £50,000 was required for the expansion of the institution and a steady income of £5000 annually for the purposes of maintenance.

Miss M. M. Chadburn, chairman of the board of management of the hospital, in reply, thanked the Chancellor of the Exchequer for his presence. In asking for money for the hospital she felt it her duty to reply to the criticism that the larger institutions should be helped, and that isolated hospitals were not wanted. The Marie Curie Hospital was not isolated; it was one of 13 radium centres approved by the Medical Research Council for doing research work in radium, and as such they undertook clinical research on the radium treatment of cancer. As many patients came to find out that they were suffering from the disease, the staff had good chances of giving treatment before the disease had developed. Although 39 beds was a small number for a hospital, Miss Chadburn pointed out that the largest hospitals do not devote 39 beds to the treatment of cancer by radium. As chairman of the board of management, she had to say that they were doing useful work, but as a member of the medical staff of the hospital she felt bound to say that they were not satisfied with the results. More opportunity was needed for expansion, and more money for equipment.

The toast of the donors—past, present, and future—was proposed by Miss Addison Phillips, who said that the hospital had a very special appeal because it was run by women working for women. Medical women had won their right of recognition and the hospital desired to extend the boundaries of knowledge and relief of human suffering.

The Hon. Mrs. Walter Runciman proposed the toast of the chairman who, she said, had once been an excellent Minister of Health, and she liked to think that he had not lost his interest in anything which promoted the health of the country. She was glad to think that he realised the quality of the work done in the Marie Curie Hospital, adding that as long as hospitals were on a voluntary basis all should realise the amount of work called for from those striving in their behalf.

Mr. Chamberlain replied briefly and announced that as the result of the banquet the appeal fund now stands at £3850.

MENTAL AFTER-CARE ASSOCIATION

In opening the 55th annual meeting of the Mental After-Care Association, held at the Incorporated Accountants' Hall on Friday, March 22nd, Lord WAKEFIELD, the chairman, said that it was with confidence that they could allow the affairs of the Association to be investigated. The proved and increasing efficiency of mental after-care constituted an asset of steadily growing value, and their work was accompanied with a sound balance sheet. There were no contingent liabilities and the many thousands of former patients who were living lives of normal merit and usefulness might well be regarded as an immense concealed asset. During the past year the work had increased in volume, the number of patients helped being 325 more than in the previous year; and while the pre-care of patients was receiving increasing attention, they would welcome here the opportunity of doing more. The constructive energies of the Association deserved to be widely known and generously supported. It was a tragedy, he held, that there was no pre-care mental clinic to which the entire civilisation of to-day could submit itself, and so drive away those imaginary fears of war that amount to hysteria. The Association had proved itself indispensable in easing the return to normal life of the convalescent mental patient.

In reviewing the report for the year 1934 the chairman of the council of the Association, Dr. REGINALD WORTH, said that the work of the society in collaboration with mental and general hospitals had been commended by the Royal Commission on mental disorders. The smoothness of the running of the activities was due in no small measure to the absence of red tape and officialdom in administration, and that increasing appreciation of the work done was manifested from the testimony of many patients. The report for the year was good and was coupled with a satisfactory balance sheet. The number of pre-care patients had increased and two more homes had been opened, while boarding-out continued. Of the 91 patients received, 69 had remained, 5 had recovered, 2 had been returned to hospital through physical illness, and 15 through lack of adaptability to outside conditions. The York and North Yorkshire branch reported increasing activity and he was glad to see that the movement was becoming more widely known to the public.

Sir HUBERT BOND moved the adoption of the report and said that Springfield Hospital had sent 118 out of 266 patients discharged, and that it was evident that Dr. W. G. Masefield could not get on at Brentwood without the Association because he had sent more patients for mental after-care than were actually discharged. The task of fitting each patient into his proper environment called for the expenditure of a good deal of time and energy; in some cases six or seven changes had been made before a patient was properly suited, and every doctor knew how valuable it was to get the environment suited to the patient. He paid tribute to the generous way in which Lord Wakefield had supported their work and remarked that all his help had been for something constructive and in aid of something that could not speak for itself.

Dr. YELLOWLEES seconded the adoption of the report and noted that the report stated that the activities of the Association were not easily made to interest the public. That he felt was not quite the case, although it was true that their publicity was entirely devoid of sensationalism or playing up to the

pitiful public ignorance of mental hospitals and their methods. He thought that the movement was better off without these methods of self-advertisement, and without any public interest which required to be thus stimulated. The main object they had in view was to prevent patients returning after treatment to the environment which had in all probability proved the cause of the disorder. But it was the spirit in which the work was performed that was the Association's biggest asset and he felt it was for that that he could claim the sympathetic consideration of all men and women. The social aspect of the work was illustrated by the fact that they endeavoured to give their help at the psychological moment, and that was when the patient came out of hospital dazed and confused that help was needed and given.

Sir WALTER LANGDON-BROWN said that the work being done was of the first importance, while every doctor knew that in mental disorder the patient labour and care of months could be thrown away in one afternoon. He proposed the re-election of the officers who would undoubtedly continue to fulfil their duties in the future as well as they had done in the past.—Sir THOMAS KEENS having seconded the proposal, it was carried.

The treasurer, Mr. J. M. OAKEY, then moved the adoption of the balance sheet and accounts and gave some interesting comparisons between the present figures and the corresponding figures for 1933. Subscriptions and donations were £690 less than the previous year, and, owing to the increased number of patients helped, their expenditure in the matter of provisions, salaries, and administration expenses had increased.—Dr. MASEFIELD, seconding the motion, said that it was very difficult for the society to advertise itself but he hoped that those present would do their best in the matter of publicity. By increased facilities for pre-care they were preventing much mental disorder, and often patients who had shown weakness in times of stress only required a change of environment for a time.

The meeting was concluded with votes of thanks to the chairman, the speakers, and to the Society of Incorporated Accountants for the use of their hall.

MEDICINE AND THE LAW

Bacilli as "Accidents"

THE decision in Leary *v.* Watts, Watts and Co., in the Hull county court last week, is likely to be taken to a higher court and will add to the rulings about "accidents" due to the action of bacilli. Leary was a messroom steward on a vessel bound for India. She coaled at Durban, and nine days later three of the crew were so seriously ill that the captain landed them at Ascension Island for medical treatment and the port medical officer diagnosed acute typhoid fever. Leary, who was one of the three, died in hospital. His widow sued the owners of the vessel under the Workmen's Compensation Act. Evidence was given that Leary and other members of the crew went ashore at Durban and had some bottled lemonade and cakes at a kiosk; one witness said he saw insects the size of ants on the cakes. Had the typhoid infection attacked Leary while he was ashore, his employers would presumably have been able to contend that it was an accident which did not arise in the course of his employment.

The county court judge considered that the overwhelming probabilities were that food was sent out from the cookhouse on board the ship which was either antecedently infected by typhoid bacilli or became so infected owing to some uncleanliness on the part of the cook. The medical witnesses concurred that the most likely date of the infection was the period when the ship was at Durban, but there was no evidence of typhoid fever existing at that port. The judge found that Leary incurred the infection on board the vessel through the mouth by infected food supplied from the cookhouse by the owners, and that this was an accident arising in the course of his employment.

There is an interesting chain of decisions about bacilli as accidents of a workman's employment. The law naturally prefers evidence plainly visible to the naked eye, and was at first reluctant to accept the bacillus for want of cast-iron proof. In 1905, in Brintons Ltd. *v.* Turvey, the House of Lords awarded compensation as for an accident when a workman sorting wool was infected by the anthrax bacillus passing into his eye. In Walker *v.* Mullins (1908) a gardener whose boot was pierced by a nail while he was digging was infected with tetanus and the case was held proper for compensation. In 1919, in Grant *v.* Kynochs, a workman had been handling artificial manure and died of blood-poisoning, an abrasion of the leg being infected. This case was held undistinguishable from Brintons Ltd. *v.* Turvey, where Lord Macnaghten had made his historic remarks on bacilli as accidents. It was an accident, he had said, that the "noxious thing" (the anthrax germ) that settled on the man's face happened to be present in the wool which he was sorting; it was an accident that it escaped the down draught of the fan; it was an accident that it should have struck the man on a delicate and tender spot in the corner of his eye. In fact, the anthrax infection was a chapter of accidents. So in Grant's case Lord Birkenhead asked the employers' counsel whether it was not equally an accident that the bacillus struck the workman on an accidental abrasion of the skin. Subsequently, in 1921 (Harris *v.* Thomas and Co.), where a farm girl had contracted ringworm from infected calves, this was held an accident entitling her to compensation. Naturally the judges have uttered warnings as to the applicant's duty to show that the bacillus entered the system of the injured workman in circumstances that would make the event an accident arising out of and in the course of his employment. It is in this connexion that Leary's case is likely to be thoroughly examined on appeal. The question whether the infection occurred ashore at Durban or on board the vessel raised the problem in a very neat form.

The Independence of Medical Referees

The following dialogue took place last week in the House of Commons at question time:—

Mr. THOMAS WILLIAMS asked the Home Secretary if he was aware of the apprehension of disabled persons while they were subject to decisions made by medical referees, when it was known that the referees frequently acted in a private capacity for employers and indemnity companies; and whether he was contemplating an amendment to the Workmen's Compensation Acts and the establishment of a board of medical referees who were not in private practice.—Sir JOHN GILMOUR replied: It is a condition of the appointment of a medical referee that he shall hold no regular employment either on the employers' or on the workers' side, but it has not been found practicable to prohibit their engaging in private practice, and proposals of the kind suggested in the question have been considered and rejected by Parliament. Great care is taken to secure the services of medical men of independent judgment and the highest possible standing, but if the hon. Member has any

individual case in mind and will send me particulars, I shall be glad to make any necessary inquiry.

Mr. WILLIAMS: Is the right hon. gentleman not aware that the last time that Parliament had an opportunity of expressing itself on this question was in 1923, and is it not the case that further instances have been brought to the notice of the Home Office from time to time? Is he not also aware that although medical practitioners are not permanently employed by employers there are cases in which they frequently act for both employers and indemnity companies, and at the same time act as referees in cases in which the same employer or indemnity company is involved, and does he think it possible for them to maintain an impartial attitude in such circumstances?

Mr. CAPORN: Is it not equally true that these doctors frequently act on behalf of the men through the trade unions?

Sir J. GILMOUR: I think I should say that it is very difficult to make absolutely certain that these medical officers act, as one would desire, without any connexion either with employers or workpeople, and if the hon. Member has a particular case which he desires to bring to my notice I shall be prepared to consider it.

Mr. WILLIAMS: Will the right hon. gentleman be good enough to reconsider the question of establishing a panel of independent medical practitioners who will neither serve employers nor employees?

Mr. A. BEVAN: Is not the right hon. gentleman aware that it is a common practice for employers to call for medical reports to be made upon cases, and a week or two afterwards for the same doctor to act as a medical referee in the case of the very applicant he has examined for the employer?

Sir J. GILMOUR: I cannot give any undertaking as to what I may do, but I am prepared to consider the problem. It is by no means an easy one to solve.

Further questions were put by Mr. Williams on March 21st as to the appointment in Yorkshire of a particular medical referee who was said to have acted on behalf of the coal-owners' indemnity association in arbitration cases. The Home Secretary, while not admitting any unfairness, repeated his assurance that he was ready to look further into the matter. The dialogue shows two different grievances. The original question suggests that the workman is prejudiced because the medical referees frequently act for the employers' side. It is hinted that professional honour is not proof against the temptation for doctors to lick the hand that occasionally feeds them. There may be much to be said for a whole-time service of entirely independent medical referees. Parliament has enabled the Lord Chancellor to appoint whole-time registrars in the county courts by requiring that the registrar (who is by profession a solicitor) shall not engage in private practice. And it is a legal maxim that not only should justice be done but justice should also seem to be done. Thus it is a rule of the legal profession that a barrister should not habitually practise in a county court whereof his father or any near relative is judge. But it is doubtful whether the opinion of unbiased observers would support the view that, in workmen's compensation cases, the medical referees favour the employers in a general way, as suggested. For every instance where this phenomenon is suspected it would probably be possible to find one or more instances where the other side suspects the opposite.

The second grievance, however—namely, that a doctor acts as medical referee in a case where he has already examined the particular workman and reported upon him to his employers—is on a different footing. Twenty years ago, in Wallis *v.* Soutter and Co., it was ruled that, where a medical referee has already expressed his opinion as referee, he ought not afterwards to sit as assessor to advise the county court judge on the same issue. The principle ought not to be disregarded, said Cozens-Hardy, M.R., that the man is compelled to have the case tried before a judge assisted by a medical man who has already pledged his professional reputation that the man had recovered. "It would be a travesty of justice—I had almost said a farce—if the workman was compelled to submit to that." Lord Justice Swinfen Eady took the same view. "However eminent and however determined to do his duty, it is not right to put the doctor into a quasi-judicial position to help the court" when he himself has previously advised that the workman is fit for work. "Everything should be done to show that the justice administered is manifest to all parties so far as it can be." These dicta throw light on the independence of the medical referee; if there is any doubt of the position Parliament should clear it up by legislation.

Compensation for Two Accidents

In Thompson *v.* L.N.E.R. Co. a man had injured his hand in 1921, while employed as a smelter. On partial recovery he was re-employed as a labourer at a lower wage but with the addition of 19*s.* 6*d.* weekly as compensation for his accident. A year ago he injured the same hand again and claimed a further 22*s.* 7*d.* weekly during incapacity. The two weekly payments would make 42*s.* 1*d.* and Section 9 of the Workmen's Compensation Act states that the weekly payment shall in no case exceed 30*s.* The county court judge awarded what he took to be the maximum of 30*s.* in view of Section 9. The Court of Appeal has allowed the workman's appeal, following a decision of the House of Lords (Hodgson *v.* West Stanley Colliery) where a woman was allowed to recover for the loss of both a husband and a son. Hodgson's case showed that the maximum under the Act was for the dependents of one workman only; the woman could recover more for two workmen. Thompson's case now shows that the maximum under the Act is for one accident only; the workman can recover more for two accidents. The case is to go to the House of Lords. The result will affect the policy of finding light work for partially incapacitated workmen.

THE BLOOD TRANSFUSION SERVICE

DONORS AT DINNER

A NUMBER of interesting announcements were made at the second annual dinner of the Voluntary Blood Donors' Association, held in London on March 21st, with Lord HORDER in the chair. The Association comprises the donors on the roll of the British Red Cross Society Blood Transfusion Service, and over 200 were present with their friends. Messages of congratulation and good wishes from the Duke of York and Sir Arthur Stanley were read by Lieut.-General Sir Harold Fawcus (director-general of the Society) who proposed their health as Our Patron and President.

Mr. GEOFFREY KEYNES, F.R.C.S., in proposing the toast of The Service, said he had been in the "blood business" longer than most people. When transfusion was introduced into the British Army in 1916 he was among the first to take advantage of the new technique. In the clearing stations there was a horrible institution known as the "moribund tent," in which all wounded men supposed to be beyond human aid were put. He specialised in going into this tent, pulling out those occupants who seemed least near death, taking them to the operating theatre and

transfusing blood into them. An astonishing number of lives were saved in this way, and later on as the value of the operation became more generally recognised it was used more and more frequently, and for less desperate cases. The problem of finding a sufficient supply of donors at once arose, however, and this problem remained after the war. At the crisis Mr. Oliver was born—he meant born a second time—and in an amazingly short time he had grappled with the situation, and the result was that London now had a voluntary blood transfusion service second to none in the world.

Mr. P. L. OLIVER, responding, said that last year the Service had answered 3855 calls, whilst 1935 showed such a further increase—105 cases in a week—as to suggest a total of over 5000 for the year. The coördination of all provincial services under similar rules and conditions was inevitable sooner or later; it should be possible for a donor, moving from one part of the country to another, to be able to volunteer for blood transfusion in the certainty that he would find similar technique, consideration, and protection prevailing in each city or town. He deprecated the tendency to make a stunt of such services—particularly a recent development in some places where car-owners offering free transport to donors were provided with badges or labels authorising them to disregard police and traffic rules. Such sanctions were likely to cause unpleasant feeling against the Service. The British Red Cross Society had set itself to abolish professional transfusion, with its manifest evils, throughout the country, but it was disconcerting that at the present time a municipal authority was advertising for professional donors in a large city where a very successful voluntary service was already running. Perhaps the greatest constructive work of the past year was the steps which had been taken for the supply of cheap testing sera, which would make it feasible for the poorest hospital and for the general practitioner to keep a supply in stock. He looked forward to the time when every patient entering hospital would be grouped as a matter of routine, irrespective of whether a transfusion was likely to be required; for everyone should know to which of the four blood groups he or she belonged. He urged very strongly that arrangements should be made at all welfare centres for expectant mothers to be grouped at an early date, and that endeavours should be made to find a suitable donor among the relatives. This would obviate eleventh-hour appeals for "universal" donors on the plea that there were no sera, pathologist, or time available for the grouping of the patient.

Mr. D. P. KENNEDY, deputy-chairman, conveyed the thanks of the Association to Dr. Canti and Mr. Keynes for the help they had given in formulating the rules that had been so beneficial in obtaining for the members skilled and considerate treatment. He mentioned a case in which he had gone to give a transfusion for a relative and had been kept waiting for some hours without attention. When the surgeon arrived and learned casually that he was a member of the Service he was horrified, and said: "Whatever you do please don't tell Mr. Oliver!"

Prof. J. W. EYRE congratulated the Association on its growth, and said he had had occasion many times during the past twelve years to make use of its members.—Mr. A. M. A. MOORE, F.R.C.S., proposed the toast of The Ladies, and Sister A. M. S. LINSTEAD, the first of the donors, responded.

Dr. H. F. BREWER said that as medical officer to the Service he had always been impressed with the keenness and enthusiasm of the donors. He gave particulars of the arrangements now being made with a well-known medical commercial firm to put efficient grouping sera on the market at a reasonable rate. Donors of a high titre will be specially reserved for this purpose; their blood will be taken at St. Bartholomew's Hospital, and the sera will be extracted and supplied in bulk to this firm, who will pack and distribute it at a price just sufficient to cover the cost, no profit being made. A rebate of 50 per cent. will be made to hospitals and provincial services affiliated to the London Service. Previously commercial grouping sera has been very expensive, and it has been quite unstandardised as regards potency. In the near future it will be possible for every hospital and general practitioner to keep a stock of reliable grouping sera without any undue charge on their finances. These arrangements should facilitate grouping, and this should diminish the excessive calls on Group IV. donors.

Mr. F. W. MILLS, chairman of the Association, read a news-cutting relating that in Rangoon a blood transfusion service has been started which will be partially supplied from prisoners in the city gaol, who will receive 30 days' remission of sentence for each transfusion undergone. He asked if they would be technically "professional donors."

Dr. R. G. CANTI, in proposing the toast of The Chairman, expressed his amazement at the far-reaching nature of Lord Horder's interests, and at the close grasp he had of them all. Dr. Canti took the opportunity of making public the fact that the Associazone Volontari Italiani del Sangue had invited the British Red Cross Society to organise the British exhibit at the forthcoming International Blood Transfusion Congress in Rome. The Society had accepted the invitation, and had appointed Dr. Brewer and Mr. Oliver as delegates.

Lord HORDER, in his reply, mentioned that during 1934 the Service had supplied 360 gallons, or over 1½ tons of blood. He feared that the donors rarely received the thanks they earned: when the transfusion was going on the patients were too ill to be grateful, and when they recovered they were too well to remember.

The musical programme was entirely contributed by members, the seven artistes having between them carried out 77 transfusions.

SOUTH AFRICA

(FROM A CORRESPONDENT)

A STATE MEDICAL SERVICE

IN the Union House of Assembly on Feb. 28th Dr. E. P. Baumann moved that the Government should consider the advisability of appointing a Commission to inquire into the urgent necessity of establishing a whole-time salaried State medical service. The Minister of Health (Mr. J. H. Hofmeyr) said that the scheme was far too ambitious but accepted an amendment asking for the appointment of a Select Committee to consider medical service and assistance to all sections of the population—this committee to consider, *inter alia*, the report of the Commission on Old Age Pensions and National Health Insurance. The amendment was carried.

In the course of his speech the Minister pointed out that the present system of district surgeons was a

State medical service, and a fairly expensive one; the Department of Health had to make provision for 13 whole-time and 327 part-time district surgeons. That was the germ of the theory of a State medical service, but they had already in practice outgrown that theory in that they had instituted a system of periodical tours. Another way in which the Government had gone beyond the theory of a State medical service was in the establishment in certain places of what might be called subsidised doctors. Last year the Government had provided £6,000 as an adjustment allowance for district surgeoncies, and £4,000 for the extension of the system of periodical tours. This year another step forward was contemplated by the provision of a further £5,000 for more district surgeoncies. They had to choose between the further development of that system and going the whole hog in the direction of Dr. Baumann's proposals. "I use the term 'going the whole hog' advisedly," said Mr. Hofmeyr, "because it seems to me that the only alternative of a policy of cautious and steady advance is the conversion of the whole of the medical profession of South Africa into servants of the State. There is no middle way."

If a State medical service meant anything, said Mr. Hofmeyr, it should mean equality of service for every citizen, and the best for the poorest. In his opinion the poorest people in the country had much more chance of getting the best attention to-day under the present system than they would have under the system proposed by Dr. Baumann. The medical profession did not support that system. "The medical profession is, indeed, somewhat behindhand in taking part in the State medical service," continued Mr. Hofmeyr. "I refer to the policy of the Government in virtually subsidising the doctors in the country districts. We pay a salary which provides a reasonable basis to a young man who has just left a university to get at least a living, but we get very few applications. The medical profession is showing that it wants to stop in the big towns. I am sorry to say that we get very little of the pioneering spirit in the medical profession to-day."

There were about 2700 medical men in the country. If Dr. Baumann's proposal became law it would mean that the State would have to pay an average salary of about £1000 per annum, and the system would thus cost the State about £2,500,000. To finance this scheme it would be necessary to double the rates of income tax and super-tax. "I say we won't do the cause of the social services of the country any good by coming along with Utopian schemes which are impracticable," said the Minister.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

THE PLIGHT OF THE MEDICAL PROFESSION

ONLY half the medical practitioners of Budapest can boast of four-roomed dwellings; their average income does not exceed 2000 pengos (£120) a year; in May, 1930, there was one week in which over 400 doctors did not see a single patient; only 10 per cent. of them own a house or land; a quarter live on allowances from their families; and only a quarter have insured their lives or are paying premiums on an annuity. In face of these unfavourable conditions it is surprising to learn from the sociological report compiled by Dr. Joseph Melly that there are also more doctors in Budapest than in any other European capital—that is 35 per 10,000 inhabitants as against 25 in Vienna, 15 in Berlin, 16 in Brussels. There appear to be three main reasons for this state of affairs: (1) the large number of doctors who have qualified in the last twenty years, 40 per cent. of those in Budapest being under forty years of age; (2) the concentration of doctors in the capital, two-thirds having immigrated from the surrounding countryside, and (3) the number of older doctors, said to be over 1300, who have lost most of their savings since the war and are unable to retire. This inability to discontinue work means that the younger men are finding it difficult to obtain salaried posts and are forced into private practice which offers a meagre livelihood and which is made very uncertain by the sick-clubs. Dr. Melly concludes his report by recommending the establishment of a medical chamber to attempt to remedy this unfortunate state of affairs.

SOME VITAL STATISTICS

The children in the schools of Budapest have grown both in weight and height since 1929. According to the latest figures published by the Hungarian statistical bureau, based on a series of 39,903 children between the ages of six and thirteen, there is an increase of 1·6–2·5 cm. in height and 0·4–1·5 kg. in weight. This improvement may be partly attributed to the measures that have been taken to see that no child in Budapest goes hungry; but it is also admitted that there is a general improvement everywhere as a result of the increased attention that is given to sport and outdoor pastimes. Another factor is that the children of the 1929 series had experienced the war and the ensuing food shortage.

It is stated that in 1933 there were 10,668 marriages in Budapest and 1025 divorces. The birth-rate shows a slight decrease from that of 1932 and more babies (1477) were born in March than in any other month. The number of deaths exceeded the number of births by 472 (as against 1405 in 1932) and the total number was 15,607. Of these 1746 were due to tuberculosis, 1546 to heart diseases, 1486 to cancer, and 1358 to pneumonia. There were 85 fewer suicides than in 1932; 1124 of the victims were women and 921 men.

DEATH OF PROF. TAUFFER

Dr. Vilmos Tauffer, who died at the end of last year, was Hungary's foremost gynæcologist. Born in 1851, he graduated at Budapest in 1874, and gained much experience abroad. In 1881 he became a lecturer in the university here, and soon, at barely 30 years of age, an ordinary university professor. His clinic then had 37 beds—20 for maternity patients and 17 for gynæcological cases. Hungarian gynæcology came into existence on these 17 beds; in 1898 a new clinic was built for him with 200. Tauffer was an ingenious operator; his motto was "Forward, and always forward!" and in abdominal surgery he was a pioneer. He was the first in Hungary to operate on the gall-bladder, and the first to extirpate a diseased kidney, and he was the first surgeon in the world who successfully sutured, by his own method, a divided ureter. In obstetrics he successfully cultivated the neglected field of saving the child and was the first to perform Cæsarean section saving also the life of the mother. As early as 1881 he could extirpate a cancerous uterus through the vagina, and it was he who introduced into Hungary the X ray treatment of malignant tumours.

Prof. Tauffer was a great admirer of English obstetrics and gynæcology, and always emphasised this in his lectures. He made frequent visits to England and had many friends there.

CORRESPONDENCE

PHYSOSTIGMINE AND BELLADONNA BY MOUTH IN MYASTHENIA GRAVIS

To the Editor of THE LANCET

SIR,—I can add further confirmation of the very remarkable and valuable effect of eserine (physostigmine) and the synthetic drug Prostigmin, in removing the muscular weakness of myasthenia gravis, discovered by Dr. M. Walker, and recently confirmed by Dr. Blake Pritchard in your columns. Whether treatment by these drugs over long periods is without harmful effect remains to be seen, for it is not yet certain that it is not a case of "flogging a tired horse." Having had the opportunity of observing Dr. Walker's two original cases, and others since, I am convinced that the effect of these drugs in myasthenia gravis is much greater than might be expected from the strychnine-like general stimulant effect of physostigmine for which it was at one time in vogue in the treatment of other kinds of paralysis. The action therefore appears specific for the weakness of myasthenia gravis, and as no ill-effects are as yet reported by Dr. Walker for the cases treated over the longest period it appears justifiable to commence prolonged treatment of other patients.

Hypodermic or intra-muscular injection has certain disadvantages outside hospital, apart from the expense of prostigmin. It may therefore be of interest that, at the suggestion of Prof. Gunn of Oxford, I have found that the administration of the more common drug physostigmine by mouth, if preceded by belladonna, has an effect entirely comparable with that of hypodermic injection of prostigmin. A patient with severe myasthenia gravis, in Guy's Hospital under the care of Dr. C. P. Symonds, was, with his kind permission, given both forms of treatment on alternate days. Whereas without these drugs severe ptosis could be induced by causing the patient to look up for 20 seconds, and very slight resistance sufficed to overcome the contraction of the closing muscles of the jaw, a hypodermic injection of prostigmin (0·002 g.) and atropine (gr. 1/100) was followed after 10–15 minutes by inability of the examiner to produce ptosis by causing the patient to look up for over two minutes continuously, and closure of the jaw was overcome only with difficulty. The effect was equally apparent after six hours and then gradually faded. When this patient took ℥ xx. of tinc. belladonnæ in water by mouth followed after 10–15 minutes by gr. 1/6 physostigmine salicylate in water, identical changes commenced to occur after 20 minutes, becoming fully developed in one to two hours and remaining maximal over at least five hours. This dosage produced no nausea or gastro-intestinal disturbance, but some general faintness with weak pulse in the first two hours probably indicates that it should not be exceeded. There is perhaps more sensation of general "tension" than following doses of prostigmin which produce equal alleviation of the weakness. It therefore would appear that administration of physostigmine in this manner is perfectly practicable. A dosage of gr. 1/8 of physostigmine salicylate thus administered once daily on an empty stomach is therefore suggested for administration over long periods. Physostigmine sulphate and the impure drug physostigmine have not been used, but there would appear to be no objection to their use in correspondingly large doses.

I am, Sir, yours faithfully,

Harley-street, W. March 20th. D. DENNY-BROWN.

BOWEL DISTENSION

THE ALIMENTARY SYSTEM AS AN ACCESSORY RESPIRATORY ORGAN

To the Editor of THE LANCET

SIR,—The theory advanced by Mr. Victor Bonney in the Bradshaw lecture, published in your issue of Dec. 14th, 1934, that post-operative distension is in the main due to blood gases diffused through the portal circulation is one that I have held for some time, and have during the last eight years discussed with several of my colleagues. My argument was based, firstly, on observations on the new-born, and, secondly, on clinical phenomena and embryological and morphological considerations.

Observations on the new-born.—I have never seen recorded a clear explanation why a new-born baby passes flatus, sometimes in quantity, by mouth and by rectum, soon after birth and before it has had any liquid nourishment. It cannot, obviously, be due to bacterial gas. During the last few years I have made a point of percussing the abdomen of babies as soon as delivered and have found the abdomen dull. In 3 to 15 minutes the whole abdomen is tympanitic. Where does the gas come from? Swallowing air, in my opinion, could not possibly account for its passing through coils of gut in such a short time.

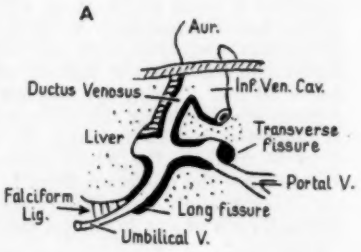
Three years ago I suggested to some friends in Sutton that they might make some observations on this point, and Drs. Green, Mylechreest, and Rea have confirmed the dull abdomen at birth. In a Cæsarean section, performed by me recently for Dr. Mylechreest, of Carshalton, one month before term, the cord was tied before pulsation ceased, and the abdomen was found completely dull on delivery. The child made six gasps of inspiration only in the first 15 minutes before regular pulmonary respiration became established, yet the abdomen was found to be tympanitic three minutes before regular respiration developed.

Miron Hajkis, in a paper on Radiographic Evidence of Live Birth in your issue of July 21st, 1934, states that (1) X rays have not been able to demonstrate air in the stomach or intestine of stillborn children. (2) Air is found radiographically in the intestines of children with extensive atelectasis, and who have lived for five minutes only. (3) Attempts at filling the intestines with air by insufflation in stillborn children filled the stomach only. (4) "The penetration of air to the stomach and intestines is due to the vital functions of swallowing and peristalsis," but Hajkis quotes "one embarrassing case" said to be born dead where a radiogram showed air in the stomach and intestine. This case was a breech, and from the description it seems impossible that this infant could have swallowed sufficient air for the stomach apart from the intestine.

As an explanation of the quick diffusion of gases into the gut, it occurred to me that a change of portal circulation induced by a stoppage of the placental circulation is the cause. That a change in the portal circulation takes place can be understood by a glance at the accompanying diagrams modified from Keith's "Embryology." Diagram A shows the placental circulation before birth. The umbilical vein is bringing oxidised placental blood to the inferior vena cava by first anastomosing with the portal vein and then by a short circuit through the ductus venosus to the inferior vena cava. Diagram B shows the state of affairs after placental separation. On separation of the placenta, thrombosis takes place in the umbilical vein and in the ductus venosus leading to their obliteration. It is obvious that this sudden obliteration of both these veins must have a profound

effect on the liver cells and on the portal circulation. Part of the portal stream into the liver is dammed off with consequent distension and congestion of the mesenteric veins, leading to diffusion of CO_2 into the gut. This portal distension may be the factor in inducing peristalsis and may explain the passing of meconium in a living child before pulmonary respiration occurs. I have often thought that this disturbance of the liver circulation may also be the chief cause of icterus neonatorum, especially if the cord be tied too soon, as is often the practice.

These observations suggest that an alimentary form of expiration takes place at the same time as, if not before, pulmonary respiration is induced. Victor Bonney states that absorption of gases into the intestinal vessels has been proved experimentally, and quotes Benedict and others as having shown that diffusion of CO_2 into the intestine is increased when the blood flow through the intestinal capillaries is slowed by partial obstruction to the venous return.



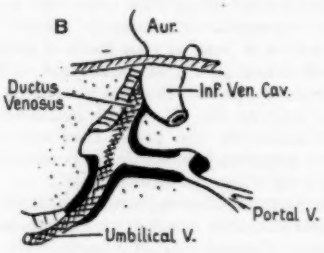
Clinical phenomena.—(1) Asthmatics, even when young, and chronic bronchitics, especially in the aged whose costal cartilages are becoming ossified, are particularly prone to flatulence. This may be due to shallow respiratory movements, and may be explained either by a diminished absorption of gases through the portal circulation or by an increased excretion of CO_2 into the gut. In my experience the wearing of a Curtis belt has decreased this flatulence probably by increasing intra-abdominal pressure and thereby aiding costal chest expansion. (2) Dr. Alfred Russell tells me that he had noticed an abnormal amount of abdominal distension in cases of pneumonia. (3) In a case of pulmonary infarct I have observed that distension of the upper abdomen was very marked within 15 minutes of the onset of the infarct. (4) I am told by a neurologist, Dr. F. R. Martin, that the wind passed by flatulent neurasthenics is frequently odourless. (5) I have known a young athlete whose bowels were moved only once a fortnight, yet he had no flatulence and presumably he had quantities of gas-forming bacteria. This case supports Bonney's statement that diminished absorption of gas plays a greater part in flatulence than increased production. (6) It has been my opinion for some years that the localised distensions arising in cases of acute volvulus, strangulated hernia, and other torsions could not conceivably be due to a sudden hyperactivity on the part of bacteria, but must be due to venous congestion causing a diffusion of blood gases.

A recent case of acute volvulus involving the terminal ileum, cæcum, ascending colon, and hepatic flexure, referred to me by Dr. McNabb of Clapham, required an operation of ilio-transverse colostomy with removal of distended gangrenous gut. The twist was two and a half times clockwise, the veins were completely thrombosed, yet this patient made an uninterrupted recovery without much general distension. This case supports Bonney's view that the blood-supply to the gut must not be entirely cut off if his hypothetical agent promoting general distension is to have full action.

However, in a case of generalised distension, such as occurs ultimately in paralytic ileus, the problem is somewhat different inasmuch as the venous congestion must be sought for more centrally, such as in the main portal vein or in the liver itself.

In a case of cholecystectomy occurring last July in a well-nourished woman of 45 the operation was unusually difficult and prolonged, the hepatic duct was drained (although the bile thus obtained was reintroduced by rectal salines), the duodenum was the only gut handled through Kocher's incision, yet a paralytic ileus developed, and in spite of the usual remedies, including acetylcholine, the patient died.

Here was a case of trauma of the liver near the portal vein with no evidence of a spreading peritonitis other than a local due to trauma, and it occurred to me that the cause of the paralytic ileus was a disturbance of the portal circulation in its entirety due either to liver trauma or to some undue pressure on the portal vein from the tube in the hepatic duct. Discussing this case with Dr. J. M. McQueen, physiologist, he informed me that in his observations of the capillary circulation in the liver of living animals, he has noticed a partial stoppage of liver circulation in cases of shock—i.e., trauma applied to the animal. This observation may explain cases of distension arising in operations outside the peritoneum, and it may well be that Bonney's hypothetical agent may be the factor in disturbing this liver circulation. That it falls most powerfully, as Bonney states, on the stomach and upper jejunum may be explained by bringing the spleen into the picture with its large portal connexion through the left gastro-epiploic vein and vasa brevia to the stomach and by the splenic vein to the duodenum and pancreas. This anatomical connexion may be the cause of the extreme gas distension in acute dilatation of the stomach.



Embryological and morphological considerations.—(1) In placental animals the oxidised blood in early fœtal life runs to the liver before entering the systemic circulation. In the chick the sole supply of oxygen is carried by veins direct to the liver from a pouch of the hind-gut, the allantois. The inference is that in fœtal life the liver must have some controlling function over the oxygen needs of the body. (2) In primitive animals the alimentary and cutaneous structures are the only channels of respiration, and in higher animals the chorion being derived from the epiblast the placental may be looked upon as morphologically a cutaneous type of respiration, whilst the lungs being derived from the fore-gut may be regarded as morphologically an alimentary type of respiration.

Although one is averse to adding to the many functions attributed to the liver, I cannot help thinking that the absorption of gases and their elimination through the gut wall must be performed by the portal circulation and the sump of this stream is undoubtedly in the liver, and anatomically it is important to note that the portal vein, unlike other veins, behaves like an artery in breaking up into capillaries in the same manner as the pulmonary artery.—I am, Sir, yours faithfully,

J. M. DUFF MITCHELL, F.R.C.S. Eng.

Harley St., W., Feb. 22nd.

MORTALITY FROM PERNICIOUS ANÆMIA IN ENGLAND AND WALES

To the Editor of THE LANCET

SIR,—In an article in THE LANCET of Jan. 5th Mr. A. Bradford Hill, D.Sc., draws certain conclusions from the mortality statistics for pernicious anæmia furnished by the Registrar-General. He concludes in part that "the sudden decline in the death-rate from pernicious anæmia in England and Wales . . . . in 1928 is testimony to the efficacy of liver therapy. . . . With an extension of liver therapy . . . it would have been reasonable to hope for a still further decline in the death-rates, below their 1928 level, but such a hope has not been fulfilled." He says: "Comparison of the death-rates at ages shows that the increase in mortality since 1928 is largely a product of an upward movement at ages over 55 years, and at ages over 75 years the death-rate now appreciably exceeds the level in the years prior to liver therapy. At . . . ages 25–55 years . . . there is a slight upward movement and a suggestion, therefore, that the original improvement is not being maintained." On this basis Dr. Hill suggests that "*as applied* the method [of treatment] in many cases may prolong life but not prevent death eventually."

Although somewhat similar trends have been observed in the general mortality figures for this disease in America, I am not inclined to take such a pessimistic view of the effectiveness of treatment as is apparently suggested by the mortality figures. These rising values may be inherent in (1) the nature of the disease, (2) the application or effectiveness of treatment, or (3) the method of collecting the mortality statistics.

On the first two suppositions I can add nothing but confirmation to the opinions of such eminent authorities as Prof. L. J. Witts and Sir George Newman, quoted by Dr. Hill. The physiological defect in pernicious anæmia responds to adequate treatment in a manner entirely consistent with that of a dietary deficiency disease such as scurvy. There is no theoretical reason or direct evidence that the uncomplicated condition itself cannot be held in abeyance indefinitely, provided therapy is adequate, i.e., given in that particular amount which is sufficient to abolish or to prevent the progress of the symptoms and signs in each individual.

I am fully aware that patients with complications, such as advanced spinal cord lesions or sepsis, cannot be classed as therapeutic risks with their more fortunate brethren. Such patients will, nevertheless, appear in the same class when the cause of death is inscribed. They become, statistically, failures of therapy; although even adequate therapy with liver extract has never been claimed to cure sepsis, or (by the judicious) to do more than to prevent further damage to the nervous system despite the frequent and sometimes remarkable subjective improvement. The development of complications is made more likely if treatment is insufficient or if ineffective preparations are used. Once developed, such complications may become the irremediable cause of therapeutic failure. Since, according to Dr. Hill's figures, the increase in the standardised death-rate reached its peak in 1932, which was about the time of the introduction of therapy with parenterally administered liver extracts (some of which are known to have been ineffective), this particular feature deserves further examination. I do not therefore wish to set aside the sobering impression conveyed by Dr. Hill's conclusions in regard to the present application of therapy. I believe, however, that inadequate therapy from one cause or another is not the sole explanation of the discouraging trends in the authority figures cited.

It has never been claimed that liver confers immortality upon those who use it. In America, both in diabetes and in pernicious anæmia, there have been recent increases in the death-rates, especially among the older patients, despite the introduction of insulin and liver therapy, respectively. It would seem reasonable to suppose that, as a result of these therapeutic advances, sufferers from both conditions, as is known for diabetes, now live long enough to die of other causes. Sometimes the immediate mortality factors, such as arterio-sclerosis in diabetes, and combined system disease in pernicious anæmia, are complications which may be regarded almost as part of the disease. In other instances, however, specific therapy has not conferred immunity from the onslaughts of pneumonia, cancer, or the motor-car.

Dr. Hill points out this fact clearly for the older group of patients with pernicious anæmia, as have Joslin and others for diabetes. His particular concern, however, is with the rising mortality of the younger group. Nevertheless, the number of patients with pernicious anæmia in the younger group must almost be increasing if, as in diabetes, life is being prolonged at all. To these younger individuals the accidents of old age may not apply, but there still exist immediate causes of death other than pernicious anæmia itself.

Necessarily what is written on the death certificate is the basis of the information which appears before the mortality statistician. It is an interesting question how far this evidence displays in anything but a nosological sense the actual cause of death in "pernicious anæmia" or "diabetes," or whether it can be successfully utilised as a basis for conclusions concerning the failure of specific therapy. It is not unlikely that when a patient who has been treated for either condition dies from any cause, the conscientious physician may include on the death certificate the name of the condition to which he has given much regular attention during life. Does a dying patient whose sugar metabolism is adequately controlled with insulin, or another whose blood has been rendered completely normal by the continued use of liver extract, have either diabetes or pernicious anæmia in a physiological sense? A post-mortem examination may disclose the characteristic appearance of the pancreas or of the stomach, respectively; but the question whether either is a contributory cause of death can be answered only by a critical appraisal of the physiological state before death, if at all.

The death-rate from diabetic coma is perhaps the best statistical index of the inadequate application of insulin. According to Joslin, in contrast to the rising mortality of all patients listed as "diabetes" on the death registers, a progressive decline in the percentage of deaths due to coma from 21·4 to 4·8 has taken place during the "Banting Era." I believe comparable figures are not available for the percentage of deaths strictly from "pernicious anæmia"; but I should be willing to guess at a similar downward trend. As humanitarians, we may lament the existence of arterio-sclerosis and combined system disease as the frequent respective complications of these two disorders. We cannot, however, unqualifiedly regard increases in the reported general mortality of either of these diseases as a quantitative index of the failure of the application of their respective specific remedies.

The existence of the deficiency disease, whether extrinsic or intrinsic in origin, thus offers a problem in the compilation of mortality statistics. Should the patient whose disease, physiologically speaking, is held

in abeyance up to the hour of death be reported as dying of diabetes or of pernicious anæmia, respectively? It is rather beyond the resources or duties of the practitioner to determine what only a very special physiological investigation before death may answer with finality. Would it not, therefore, be an aid in the interpretation of the mortality statistics for deficiency diseases if some designation could be used to indicate the practitioner's estimate of the importance of the physiological state of the patient in contributing to his death? It would seem that the interpretation of statistics would be facilitated if some such designation as "controlled" were appended to the death certificates of persons dying with, for example, adequately treated diabetes, myxœdema, or pernicious anæmia. The true failures of specific therapy might be brought out more clearly by such data.

I am, Sir, yours faithfully,

Boston, Mass., U.S.A., March 8th. W. B. CASTLE.

To the Editor of THE LANCET

SIR,—I am indebted to you for the opportunity of seeing Dr. Castle's letter before its publication and for affording me space in which to comment upon it and upon previous correspondence provoked by my study of the death-rates from pernicious anæmia. The main point at issue is, I think, whether the rise in mortality since 1928 is the result of inadequate treatment (or a lack of the continuation of adequate treatment) or is merely due to the fact that a patient whose death from the disease has been prevented by treatment is nevertheless statistically debited to it when he dies of a quite unrelated disease.

In support of the former view, I need only point to the figures published in your columns by Dyke and Harvey (1933, ii., 59), quoted by some of your correspondents, and by Mills and Herring (1935, i., 488) whose results have appeared since my paper was published. These studies clearly suggest than an appreciable proportion of patients fail to carry on with proper supervision and treatment and experience very high relapse and mortality-rates.

With regard to the latter view, it appears to me that Dr. Castle and Drs. Davidson and Fullerton overlook some of the principles of certification and tabulation. The medical certificate of cause of death requires information as to the immediate cause of death and (1) morbid conditions, if any, giving rise to immediate cause, and (2) other morbid conditions (if important) contributing to death but not related to immediate cause. I am not clear, therefore, why "the conscientious physician" in the case of a patient whose pernicious anæmia "is held in abeyance up to the hour of death" and who dies from some intercurrent disease should include on the death certificate "the name of the condition to which he has given much regular attention during life." The inclusion of pernicious anæmia on the certificate is obviously an admission that, directly or indirectly, it *was an important contributor* to the fatal issue. If such were the case, no serious objection can be made against the death being tabulated to pernicious anæmia. But will, in fact, it be so tabulated? In many cases it will not. Dr. Castle is particularly unfortunate in his choice of hypothetical examples, for in two out of three the death would *not* be tabulated to pernicious anæmia even if the conscientious physician felt impelled to mention it. In the Registrar-General's tabulation of deaths ascribed to joint causes, violence (e.g., the motor-car) takes, with a few logical exceptions, precedence of any other cause of death. Similarly, a certificate containing the entries cancer and pernicious anæmia would be tabulated to cancer.

It follows that in many cases the alleged impulse of the conscientious physician to ignore the requirements of the death certificate cannot influence unfavourably the mortality-rate from pernicious anæmia. In other cases it would undoubtedly do so, and I do not deny that "misleading information" may be contributing to the rise in mortality; but that, at present, is merely hypothesis, while there is, it seems to me, positive evidence of the presence and results of inefficient treatment.

I am, Sir, yours faithfully,

A. BRADFORD HILL.

London School of Hygiene and Tropical Medicine, Keppel-street, W.C., March 22nd.

SAFETY VALVES FOR ANÆSTHETIC APPARATUS

To the Editor of THE LANCET

SIR,—The Surgical Instrument Manufacturers' Association has received a communication from Sir Francis Shipway calling attention to the fact that during anæsthesia induced by a warm ether apparatus a fatality recently occurred, owing to the bellows having been connected to the wrong (or outlet) tube of the ether or chloroform bottle, with the result that liquid anæsthetic was pumped into the patient's throat. He emphasised that something must be done at once to prevent a repetition of such a disaster. The committee of this association are of the opinion that a question of such general importance should come within the province of the Institute of British Surgical Technicians now in course of formation, but in view of the urgency of the matter have taken immediate action and have designed safety valves for use with warm ether apparatus, Junker's chloroform bottles and similar anæsthetic units with which such an accident might occur in use.

The valves designed have been submitted to and approved by Sir Francis Shipway and are shown in the illustrations. Prints showing the exact nature and method of manufacture of these valves have been circulated to every surgical instrument firm in Great Britain affiliated to this association. Particulars of these valves have also been circulated to the Incorporated Association of Hospital Officers and the Central Bureau of Hospital Information. In designing these valves the committee have borne in mind that it is necessary to render safe, in the event of incorrect fitting of bellows, the great number of existing chloroform and ether apparatus now in use, and that this must be effected in a simple, uniform, and economical manner.

In investigating this apparently simple problem a certain number of difficulties were encountered. Many varieties of valves were tried (glass to glass, &c.) and were found unsatisfactory. Some satisfactory valves were rejected as expensive and complicated.

Valves to use with liquid chloroform.—The ordinary Rigby type ball valve, fitted to the inlet tube, when immersed in chloroform was found to be sufficiently reliable to be considered safe. A ball valve fitted to the outlet tube (dry and air exposed) is not uniform in its action, is not so effective, and is not considered safe.

Valves for use with liquid ether.—In this case conditions are very different from those when using chloroform. Ether is extremely mobile and penetrating. It has a low specific gravity (about half that of chloroform), and is a non-viscous fluid. Immersing a ball valve in ether has little effect, and does not improve the sealing and functioning of the valve to the extent as when it is immersed in chloroform. Experiments show that a simple ball valve fitted into the inlet tube immersed in ether, unless it is a super-perfect valve, cannot by itself be considered safe. A ball valve fitted to the outlet tube has the effect of making the anæsthetic bottle a

FIG. 1.—Shipway's (S.I.M.A.) warm ether appartaus bottle fitted with valves.

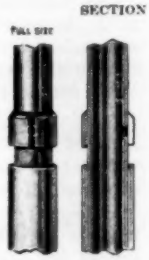


FIG. 2.—Perforated inlet tube (S.I.M.A.).

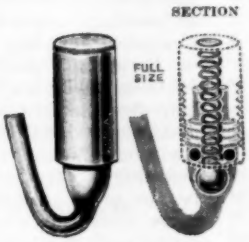


FIG. 3.—Spring-loaded Rigby's valve (S.I.M.A.).

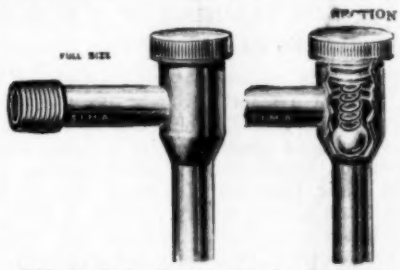


FIG. 4.—Spring-loaded exit valve (S.I.M.A.).

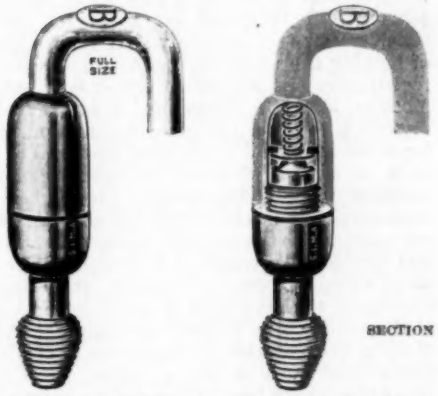


FIG. 5.—Routh' inlet valve (S.I.M.A.). For use as an exit valve the position of the inlet and outlet tubes should be as on the spring-loaded exit valve in illustration No. 4.

closed chamber. The ether acting under the pressure of its own vapour enters the inlet tube. The method of a single ball valve on the outlet tube cannot by itself be considered safe. It is found when using a spring-loaded ball valve on the inlet tube that if a small hole (about 1·5 mm. diameter) is drilled at the top of the inlet tube inside the bottle it is sufficient to ensure the safe working of the ball valve. On trial it is shown to prevent the ejection of ether even when the ball valve itself is not perfect. In drawing up the recommendations noted below the committee recognise that ball valves are not always perfect and, at times, may leak. In the case of chloroform the fluid is heavy and is sufficiently viscous to more or less seal any slight defect. When using ether, conditions are entirely different; there is practically no sealing.

We therefore make the following recommendations:

(1) *All chloroform bottles* to be fitted with a ball valve of the Rigby type, spring-loaded, as shown on the prints and illustrations circulated. The inlet tube at the point where the bellows are attached should be plainly marked with a "B" or in some other unmistakable manner.

(2) *Ether bottles, Shipway's pattern* (Fig. 1).—Inlet tubes to be marked as noted for chloroform bottles. The inner tube should have a 1·5 mm. aperture at the top, inside the bottle (Fig. 2). This aperture should be made in such a way that it is not possible for it to become accidentally covered by the rubber bung or extending tube. The distal end of the tube which dips into the ether should be fitted with a ball valve of the Rigby type (Fig. 3). The ball should be fixed in such a way that it cannot be accidentally displaced. It should be held down against its seating by a spring contained in the cap. This spring should be fixed to the cap or rendered inaccessible in some way so that it cannot be accidentally lost or displaced. The exit tube should be furnished with a well-made valve, such as a Rigby ball valve (Fig. 4) with a spring-loading (made with the same precautions as before stated) or a flat ground copper-plate valve (Major L. N. Routh's model) with a spring-loading (Fig. 5).

When using the above valves, one point must be borne in mind. Careful examination of safety valves which have been returned for repair after prolonged use show that these valves collect sulphur and chalk from the rubber bellows, and fluff and cotton-wool from the air stream. These materials become deposited in the valve; it is therefore necessary that valves should be tested periodically, and if found not to be functioning satisfactorily they should be returned to the makers for adjustment.

The committee recommend all members of the Surgical Instrument Manufacturers' Association neither to stock nor list any anæsthetic apparatus with which it is possible for liquid anæsthetic to be injected into the patient's throat. Further, that if asked to make an apparatus with which such an accident is possible, they should on every occasion warn the intending purchaser of its potential dangers.

We are, Sir, yours faithfully,

H. GUY DREW (Down Bros., Ltd.),
Chairman.

Committee:
- P. G. PHELPS (Mayer and Phelps, Ltd.) (Vice-Chairman).
- F. C. KING (Allen and Hanburys, Ltd.) (Hon. Treasurer).
- A. W. DOWN (Down Bros., Ltd.).
- A. N. GARDNER (J. Gardner and Son).
- E. G. GREVILLE (Medical Supply Association, Ltd.).
- H. E. HOTCHKIN (John Weiss and Son, Ltd.).
- E. W. MAYER (Mayer and Phelps, Ltd.).
- T. M. PROUDFOOT (Arnold and Sons).
- W. T. R. BECKETT (Beckett and Bird, Ltd.) Hon. Secretary.

Surgical Instrument Manufacturers' Association, Holborn Viaduct, E.C. 1.

THE TRAINING OF A SURGEON

To the Editor of THE LANCET

SIR,—The report in THE LANCET of March 16th (p. 613) of a meeting of the surgical section of the Royal Society of Medicine can be summarised thus: that surgeons should receive a more liberal general education before starting their medical studies, and that their post-graduate work should be directed into some special sphere. There is every hope that the latter requirement will be met, and my object is to suggest a possibility for attaining the former. Dr. Hurst rightly regrets that much of the preliminary work is done at school. This is not the wish of the schools, but is forced on them by parents from considerations of economy; it is the direct result of making the minimum period for qualification after registration six instead of five years. One year of medical study is therefore done at school. The remedy is to lower the present minimum to five years for those who show a sufficient standard of education, such as having obtained an open scholarship at a university or having passed the higher certificate examination. I believe this course would find favour with the public schools, the universities, the hospitals, and the Royal Colleges. I need hardly add that it is of equal if not of greater importance for a physician to have had a good general education. If those influential bodies could approach the General Medical Council with a proposition of this kind, there should still be a chance of letting boys finish their education along broad lines before entering on their medical studies.

I am, Sir, yours faithfully,

Rugby, March 25th. R. E. SMITH.

THE PSYCHONEUROSES

To the Editor of THE LANCET

SIR,—May I venture to take strong exception to a remarkable sentence which occurs in, and seems to me to ruin, your otherwise excellent and accurate leading article upon the Need for Medical Psychologists in your issue of March 16th. It contains the following statements:—

(1) "The diploma in psychological medicine was designed primarily for those proceeding to asylum work. . . ." This is not only untrue, but palpably absurd. The diploma is conferred on those who have not only ability but training and experience in psychological medicine. "Asylum work" is a necessary and important part of this experience, but to say that the diploma is designed primarily for those *proceeding to* asylum work is to talk nonsense.

(2) ". . . except for diagnostic purposes, a training in psychiatry or organic neurology is of little value in the handling of the psychoneuroses." That such a statement could appear in a reputable journal is in itself all the comment necessary on the present sad state of affairs. "Diagnostic purposes" happen to be of almost supreme importance in the handling of the psychoneuroses. How otherwise are we to know that they are psychoneuroses at all? It is probably the lack of diagnostic ability more than any other single factor which has led to so much pitiable failure and tragedy in treatment.

The climax is surely reached by the lumping together of psychiatry and organic neurology, with the implication that knowledge of the one is just as important, or rather as unimportant, as knowledge of the other in the handling of the psychoneuroses. The statement is so devoid of meaning and so divorced from intelligent thought, that it approaches the level of "It is just nerves, doctor, isn't it?" May I venture to enunciate once again the elementary proposition that "the handling of the psychoneuroses" is a dealing with human personalities, motives, and conduct, not with brain-cells and nerve-fibres. Until that fact with its implications is understood there is no basis for argument.

I am, Sir, yours faithfully,

Harley-street, W. March 21st. HENRY YELLOWLEES.

*** It was wished to indicate the function of the diploma as a qualification for asylum service, and in using the phrase "proceeding to" the fact that asylum experience is accepted as one of the requirements for admission to the examination was overlooked. Dr. Yellowlees's criticism is valid here, but his other exceptions are not clear. Among the psychoneuroses that make up so large a proportion of illness in general practice some will, for diagnostic purposes, demand a knowledge of insanity, but the psychotherapist may have to distinguish between an abdominal neurosis and gastric ulcer, between hysterical dyspnœa and the laryngeal crises of tabes, or between organic and psychogenic impotence. In these and many other cases he will derive little help from asylum experience, either in diagnosis or treatment. Sufferers from "nerves" are still commonly assumed to belong to the province of neurology. Our view of this assumption seems to be the same as that of Dr. Yellowlees, who should agree that the study of organic neurology, which forms part of the course for the diploma in psychological medicine, is not of special value in the handling of the psychoneuroses.—ED. L.

PLASTER-OF-PARIS IN COLLES'S FRACTURE

To the Editor of THE LANCET

SIR,—In their excellent article in your issue of March 16th (p. 609) Mr. Blauvelt and Mr. Willway state that they ". . . do not claim better results for the method, believing that the end-result in the main depends upon the primary reduction . . ." I feel that they are too modest here, as with any other method of fixation, and especially with Carr's splint, there is a definite risk of recurrence of the displacement. They refer to this earlier in their article. Mr. Platt (as he reminded us last week) also stressed it at the B.M.A. meeting in 1932, and it was quite a common, if not sufficiently recognised, complication of the pre-plaster days. Displacement may still recur, even in a skin-tight plaster, if considerable swelling is present before reduction, but this is very rare. I think that one can now say that, from the improvement in this factor alone, better results are obtained with plaster.

The chief difficulty we have in our fracture clinic is the maintenance of finger and hand movements. It is our experience that the average hospital patient, on being told to use his fingers, produces something approaching the obstetric hand. The suggestion of work is not usually well received. Occupational therapy was started in the massage department but was discontinued as it was regarded with suspicion, the opinion being voiced that the hospital was getting its work—e.g., peeling potatoes—done for nothing. We have recently instituted the following memorandum which we issue to all these patients, first taking the precaution of reading it to them:

Your fracture has been set and is held in position by plaster-of-Paris. No movements that you can perform can now displace the broken bones. On the other hand, all movements of the limb that you can make, and particularly of the hand and fingers, are to be encouraged,

as they keep the muscles from wasting, preserve the normal mobility of the hand, help the bones to join up, and render unnecessary treatment by massage when the plaster is removed.

Male patients.—Where possible they should return to work after one week. Clerical workers, &c., should be able to perform their usual tasks. Labourers, agricultural or industrial, will be unable to do heavy manual work, but should start light work after one week.

Female patients.—In dressing, and especially dressing the hair, use the injured arm as much if not more than the sound one. The ordinary routine housework can be performed, using the injured arm normally, but care should be taken not to wet the plaster.

To both.—Make as much use of the injured arm as of the sound one.

This is producing better results, though it still does not prevent an occasional patient arriving up from the country after five weeks with his arm inside his shirt and firmly anchored to his body by a sling and early adhesions around the shoulder-joint.

There is one further point in technique. A palmar plaster bar cannot allow full flexion at both the metacarpo-phalangeal and phalangeal joints—namely, 90°. Following a suggestion of Watson Jones, we have substituted layers of ½ in. strapping (not elastoplast, which stretches), permitting better movement while maintaining the wrist against the dorsal plaster slab.

I am, Sir, yours faithfully,

Norwich, March 25th. H. A. BRITTAIN.

DETECTION OF LEAD POISONING

To the Editor of THE LANCET

SIR,—Will you allow me to point out that the leading article on this subject in your issue of March 2nd (p. 501) tells only part of the story, since it omits all reference to recent work that has been done in this country?

The method of L. T. Fairhall, to which your summary refers, was found to be unreliable by the Committee of Enquiry on Lead Ethyl Petrol, since it gives too low results. Therefore, at the request of the Committee, work was undertaken by Messrs. Francis, Buchan, and Harvey (Analyst, 1929, liv., 725), and an accurate method for the determination of small quantities of lead in urine and biological material was worked out in the Government laboratory and has since become classic. Although the diphenyldithiocarbazone method has been applied by Ross and Lucas (1933) and by Bohnenkamp and Lineweh (1933), it was originally devised by N. L. Allport and G. H. Skrimshire (ibid., 1932, lvii., 440), who based it on the observations of H. Fischer (Zeits. f. angew. Chem., 1929, xlii., 1025) upon the reactions of the reagent with various metals, but there is no reference to this in your report. Incidentally, since lead is a normal constituent of peripheral blood, what advantage is gained by detecting 0·1 γ of lead in the system, assuming that the difficulties of attaining such a degree of accuracy in the quantitative application of the method have been overcome?

Lastly, since your survey is presumably intended to give an outline of the development of the methods of detecting lead poisoning, it seems strange that it does not contain any mention of the outstanding work of Dr. Roche Lynch (Analyst, 1934, lix., 787) and his colleagues on the determination of traces of lead in biological material, with special reference to bone.

I am, Sir, yours faithfully,

C. AINSWORTH MITCHELL.

"The Analyst," 85, Eccleston-square, London, S.W., March 19th.

*** The title of the article was perhaps too inclusive. The intention was to review briefly the most recent methods—spectrographic and microchemical—for the speedy detection at short notice of pathological amounts of lead in small samples of material (blood, C.S.F., or urine) from cases of acute encephalitis. In these cases a quick result is the thing that matters, and the papers referred to were those which dealt particularly with this phase of lead estimation. The advantage gained by being able to detect as little as 0·1 γ of lead is the possibility of using minute quantities of blood, with resulting speed and ease of manipulation. Dr. Roche Lynch's important work, which was referred to when he made his communication to the Society of Public Analysts (see THE LANCET, 1934, ii., 854) is primarily concerned with the estimation of lead in bone. Although details were given for blood estimation, these applied to samples much larger than those easily obtained from children in the acute stages of lead poisoning.—ED. L.

PUBLIC HEALTH

A Milk-borne Epidemic

THE outbreak of scarlet fever among children attending council schools at Denham, Bucks, has now definitely been traced to milk infected by carriers of hæmolytic streptococcus (Type 1). Eighty-six children were directly infected by raw milk from two local farms; the children who escaped either did not have any milk at school or had dried malted milk. At one of the farms two of the bottlers were found to have hæmolytic streptococci in their throats, but on further examination in one case the organism proved not to be of the type causing the outbreak, and in the other case the throat infection cleared up so quickly as to make it probable that the man was himself infected by drinking milk. A milker on the other farm was found to have Type 1 streptococcus in his throat, while sores on the udder of the cow he milked were free from the germ although the milk itself contained it. This man was removed to hospital on a magistrate's order, along with his two children, who were also found to harbour the same germ. After the milk was stopped the epidemic at once ceased, but two of the children died, one a boy of seven from broncho-pneumonia, the other a girl of eight who developed acute appendicitis after making a good recovery from scarlet fever. Apart from the definite cases of scarlet fever a number of children who drank the raw milk developed slight fever, sore-throat and, in some cases, sickness. Dr. V. A. T. Spong, medical officer of health to the Eton Rural District Council, to whom we owe many of these details, concluded a report to his council by saying: "Unless all persons engaged in the production of milk are swabbed every two or three days, one cannot guarantee that they are not carrying disease germs which may in one way or another infect the milk. The only practicable remedy is in my opinion . . . the pasteurisation of the milk-supply . . . and mechanical bottling after pasteurisation."

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 16th, 1935.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2473; diphtheria, 1444; enteric fever,

25; acute pneumonia (primary or influenzal), 1322; puerperal fever, 41; puerperal pyrexia, 127; cerebro-spinal fever, 24; acute poliomyelitis, 4; encephalitis lethargica, 8; dysentery, 15; ophthalmia neonatorum, 75. No case of cholera plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 23rd was 3900, which included: Small-pox, 0 under treatment, 0 under observation; scarlet fever, 1175; diphtheria, 1736; measles, 12; whooping-cough, 308; puerperal fever, 35 mothers (plus 11 babies); encephalitis lethargica, 267; poliomyelitis, 1. At St. Margaret's Hospital there were 20 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 3 (1) from enteric fever, 16 (0) from measles, 4 (0) from scarlet fever, 16 (3) from whooping-cough, 58 (11) from diphtheria, 51 (19) from diarrhœa and enteritis under two years, and 140 (20) from influenza. The figures in parentheses are those for London itself.

There has been practically no further rise in the number of deaths attributed to influenza, the deaths for the last few weeks (working backwards) being 145, 139, 83, 91, 83, 91, 71. This week these deaths were distributed over 59 great towns, Liverpool reporting 15, Manchester 9, Cardiff 5, Hove, Bolton, Sheffield, Birmingham, Stoke-on-Trent, and Swansea each 4. Six fatal cases of diphtheria were reported from Liverpool, 3 each from Bradford, Oldham, and West Bromwich. Ashton-under-Lyne and Liverpool each reported one death from enteric fever.

The number of stillbirths notified during the week was 267 (corresponding to a rate of 40 per 1000 total births), including 39 in London.

PROVISIONAL DEATH-RATES FOR 1934

Provisional death-rates per million population for England and Wales during the year 1934 are now available as follows:—

	Males.	Females.	Persons.
Respiratory tuberculosis ..	759 ..	520 ..	635
Other tuberculosis	140 ..	118 ..	129
Cancer	1534 ..	1590 ..	1563

The maternal mortality (provisional) based on deaths primarily classed to puerperal conditions is as follows:—

Puerperal sepsis per 1000 live births 2·03, per 1000 total births 1·95.

Other accidents and diseases of pregnancy and parturition per 1000 live births 2·57, per 1000 total births 2·46.

PANEL AND CONTRACT PRACTICE

The Domiciliary Service in Newcastle-upon-Tyne

ENOUGH time has now elapsed for the M.O.H. of Newcastle-upon-Tyne to form a provisional opinion on the working of the open-choice method of providing domiciliary medical service in the city. This was introduced in November, 1933, when any person entitled to medical relief became free to select his own medical attendant from the open panel of medical practitioners who have contracted with the council to provide such services. The panel consists of 50 practitioners, being nearly two-thirds of the panel of insurance practitioners in the area. A sum of £1200 was set aside by the council to constitute a pool out of which payment was to be made in proportion to the total number of services rendered, and it was anticipated that the fee payable per unit service, exclusive of medicine, would work out at about 1*s.* 3½*d.* A visit to the patient's home or a consultation at the doctor's surgery is each assessed as one unit, mere repetition of a prescription counting as half a unit. The anticipation has proved almost laughably incorrect, as the total number of services called for since the open-choice was started has been more than 42,000 over a period of 42 weeks, compared with 16,500 over a corresponding period under the old régime. This extraordinary increase in the total number of services has reduced the fee payable per unit service to about 5½*d.* The most important factor in the expansion of the work has been the larger number of children coming within its purview. There has been little or no change in the number of visits paid to chronic or long-period patients, but under the new régime attendance on a short-period or acute type of case has meant 5·2 units of service instead of 2·9 under the old régime, and Dr. Charles remarks that this standard of medical care cannot be considered unreasonably or extravagantly high. There is, he thinks, no evidence that the pool has been exploited by individual practitioners; the low rate of remuneration must therefore receive immediate attention. There has also been a smaller but definite increase in the cost of medical extras, due almost entirely to the increase in the number of patients treated; drugs, too, have proved costly, for whereas a prescription dispensed under the insurance scheme costs on the average 8·6*d.*, it has cost 9·7*d.* under the existing arrangement with the Newcastle Dispensary. The confidence of patients has been gained by the use of the N.H.I. formulary, which satisfies them that they are receiving drugs and appliances of the same standard as their fellow-workers who are in employment. The record cards, Dr. Charles says, have on the whole been well kept, but the repetitive work involved has been found burdensome and he would like to see it reduced by substituting for the open-choice method the system of payment on a capitation basis already in vogue in some other districts—e.g., East Ham and Wiltshire—which avoids the necessity of enumerating the individual services ranking for payment. In reviewing the experimental year Dr. Charles shows good reason for believing that the new plan has benefited all parties concerned; his health committee will have the satisfaction of knowing that the domiciliary service thus opened up is a step nearer to the ideal service capable of fulfilling all the needs of the community. One thing found desirable is a more complete coöperation with the work of the nursing associations, which would enhance the efficiency of the service.

Assistants and Partners

An assistant to an insurance practitioner recently informed the Birmingham medical benefit subcommittee that he desired to accept insured persons for treatment and to have their names included in his own list. As this assistant's name is on the insurance committee's medical list, and as the principal has informed the committee that the assistant may accept insured persons in his own name and that the terms of the agreement between them do not preclude him from doing so, in future any insured persons accepted for treatment by the assistant will be included in his own list and not in the list of his principal. This is said to be the first instance in Birmingham in which an assistant is undertaking individual responsibility for the treatment of insured persons. The arrangement is an unusual one for two reasons. Assistants are apt to come and go, and it would mean that every insured person would have the right to choose another doctor, not necessarily in the same firm, with every change of assistant—a risk that many principals would not care to take. It would also entail much additional clerical work, for the committee has to print and send notices to each insured person, informing him of the change and of his right to

choose another insurance practitioner. So far as such an arrangement exists it cuts away one of the arguments against a principal with a big list who employs an assistant. Its rarity goes to show that most insurance doctors prefer to keep control in their own hands, even though it means accepting responsibility for the omissions and commissions of an assistant.

This may be the place to pick up a slip which was made in this column a fortnight ago in the hypothetical case of two doctors in partnership, one with 4999 patients on his list, the other with only one. There is a regulation which says: In the case of two or more insurance practitioners carrying on practice in partnership the number on the list of any one of such practitioners shall not exceed 3000, and the average on the list of both or all of the partners shall not exceed 2500. This does not affect the argument that a Newcastle-London partnership is legally possible, although under the present regulations the London partner would be only allowed to have a list of 3,000. Such a partnership should be legally impossible.

OBITUARY

JAMES CARDWELL GARDNER, M.B. Camb.

THE death occurred on March 25th of Dr. James Cardwell Gardner at the age of 70, who, apart from his sound work in public service, was well known in all athletic circles for his varied accomplishments in sport. He was educated at Rugby, and while there won the public schools shooting championship. He proceeded to Emanuel College, Cambridge, and later to St. George's Hospital for his clinical training. He graduated at Cambridge as M.B., B.Ch. in 1894, and was both house physician and house surgeon at his hospital. He proceeded almost immediately to take up practice in Amersham, where he remained until the end of his life. He was for a time M.O.H. to the Amersham Rural District, and 20 years ago was made a J.P. for the county of Buckinghamshire being later chairman of the Amersham bench. Gardner's all-round efficiency at sport was remarkable. He stroked the Cambridge boat for three years, twice to victory; he won the Colquhouns, the Diamonds, and the Wingfield sculls in various years; he played Rugby football with distinction for important clubs, was a well-known boxer, and a fine horseman, being for some years secretary of the Old Berkeley Hunt. Later in life he was a keen golfer and shot. Such a record of all-round proficiency in sport is indeed remarkable.

ALAN ARMOUR FOTHERGILL, M.B., F.R.C.S. Edin.

THE death occurred on March 8th, in Edinburgh, of Dr. Alan Armour Fothergill at the premature age of 37, from a severe attack of influenzal pneumonia. He was educated at the Edinburgh Academy, where he was when the war broke out, and enlisted at the age of 18 in the 8th Seaforth Highlanders. He served as a signaller in France during 1917 and 1918, when he was incapacitated in a gas attack on the Somme. In 1919 he entered Edinburgh University as a medical student and graduated M.B., Ch.B. Edin., in 1924. He went to Manchester, where his cousin, William Fothergill, was professor of obstetrics and gynæcology, and served as house surgeon in the obstetrical and gynæcological branches of St. Mary's Hospital, Manchester, and was for a time resident surgical officer in the gynæcological branch. After acting as ship's surgeon in a voyage to Japan, he was appointed house surgeon to the Dreadnought Hospital, Greenwich, but in 1929 he returned to Edinburgh, obtained the F.R.C.S. Edin., and took up general practice.

One who knew him well writes of him: "It was characteristic of him, identified as he was with the Labour movement, that he selected the neighbourhood of one of the largest working-class areas in which to settle. During this time he was closely connected with the Scottish Youth Hostel movement, for which he acted as national secretary from its inception till the spring of 1934, and more recently he took an active and enthusiastic part in the organisation of the public medical service in Edinburgh. He had indeed a 'passion for getting things done,' and this was evident in his work for the many causes with which he identified himself. The strong, personal interest which he took in the welfare of his patients endeared him to them, and many of them feel that they have lost not only a doctor but a friend. Our sympathies go out to the young widow whom he leaves behind."

G. H. MONRO-HOME, M.D. Edin.

THE death occurred on March 11th of Dr. George Home Monro-Home, at Great Barton, Bury St. Edmunds, where he had resided for some years. He was a descendant of the Monro family who from 1720 till 1859 held a monopoly of the professorship of anatomy at Edinburgh, the third Alexander Monro, "Tertius" as he was popularly called, being Dr. George Monro-Home's great-grandfather. George Monro-Home was born in New Zealand and came to this country to enter King William's College, Isle of Man, for his general education, where he distinguished himself as an athlete. He proceeded to St. Andrew's University and finally migrated to the University of Edinburgh, where he graduated as M.B., C.M. in 1890, proceeding later to the M.D. degree. Here also he was a prominent athlete. After qualification he practised in Hartlepool, Nottingham, and Liverpool, before going out to China at the instance of a brother, a naval officer, who held an appointment at the Naval College at Nanking. He obtained an appointment with the China Mutual Assurance Company, a position which necessitated extensive travelling through various Chinese provinces, and the war broke out while he was working for the company with his official centre at Shanghai. He took over the post of port health officer at Shanghai from a younger man and held it until his predecessor's return from the war, when he retired, having been 14 years in China. He then settled near Bury St. Edmunds, where he became widely known as a dog fancier and breeder of Labradors. He was unmarried.

REGINALD JANSON HANBURY, M.R.C.S., L.R.C.P.

Mr. Reginald Janson Hanbury, a member of the well-known firm of Allen and Hanburys Ltd., died on Wednesday, March 20th, at his home in Surrey, in the fifty-eighth year of his age. He was the second son of Mr. F. J. Hanbury, the present chairman of Allen and Hanburys Ltd., and was educated at Marlborough, obtaining his clinical training at St. Bartholomew's Hospital, London. He took the English double diploma in 1903 and joined the family

business immediately. He was a grandson of Cornelius Hanbury, who was chairman of the firm when he became a member, and in 1912 was elected to the directorate. Like his grandfather and other members of the family, he was a governor of St. Bartholomew's Hospital and for several years served on the finance committee of the institution. He was held in esteem by all who came into contact with him, both in business and in private relations. Mr. Hanbury leaves a widow and three children.

HENRY ERSKINE SOUTH, Surg.-Capt., R.N. M.R.C.S. Eng.

THE news of the death, at the age of 72, of Surgeon-Captain H. E. South, R.N., which occurred on March 18th, 1935, following double pneumonia, has been received with deep regret amongst a wide circle of friends, both in the Services and in civil life. He was born in 1862, and received his general education at Charterhouse, proceeding to St. George's Hospital for his medical training. He qualified as M.R.C.S., L.R.C.P. in 1885, and soon after joined the Royal Navy, where his work and personality speedily won for him esteem and popularity. During the war he served with distinction, first as Surgeon Commander to H.M.S. *Courageous*, and subsequently as P.M.O. to Devonport Dockyard. On the termination of hostilities he was appointed to the medical staff of the Ministry of Pensions and later to the Pensions Appeal Tribunal. In each post, his work was rendered the more valuable by his long experience of Service conditions and the special gift he possessed of assessing the personality as well as the physical condition of the man under review. A man of outstanding appearance and physique, Captain South's looks belied his years, and his sudden death has come as a shock to his friends.

THE SERVICES

COMMISSIONS IN THE ROYAL ARMY MEDICAL CORPS

THE War Office announces that applications are invited from medical men for appointment to commissions in the Royal Army Medical Corps. Candidates will be selected for commissions without competitive examination and will be required to present themselves in London for interview and physical examination on or about April 25th. They must be registered under the Medical Acts and normally must not be over the age of 28 years. Successful candidates will in the first instance be given short service commissions for five years, at the end of which period they may either retire with a gratuity of £1000, or apply for a permanent commission. Permanent commissions will be given to officers selected from among those who wish to make the Army their permanent career.

Full particulars on application, either by letter or in person, to the assistant director-general, Army Medical Services, The War Office, London, S.W.1.

ROYAL NAVAL MEDICAL SERVICE

Surg. Capt. K. H. Hole, O.B.E., to *Pembroke* for R.N. Hospital, Chatham.

Surg. Comdr. E. Heffernan to *Drake* for R.N.B.

Surg. Lt.-Comdr. J. M. Sloane to *Victory* for R.N.B.

Surg. Lt. C. P. Collins to *Lupin*.

S. J. van Pelt and A. P. C. Clark entered as Surg. Lts. for short service, and both appointed to *Victory* for R.N. Hospital, Haslar.

ROYAL NAVAL RESERVE

Lt.-Comdr. R. Sell placed on the Retd. List with rank of Comdr.

Payr. Lt. J. W. Edelsten to *Hood*.

Sub-Lts. A. O. Wills, N. R. Murch, and E. W. Morgan promoted to Lts. (seny. respectively Feb. 26th, March 2nd and 3rd).

Act. Sub-Lt. J. Pearce promoted to Sub-Lt. (seny. Oct. 15th, 1934).

Proby. Surg. Sub-Lt. C. P. Nicholas to *Rodney*.

ROYAL ARMY MEDICAL CORPS

TERRITORIAL ARMY

Capts. O. F. W. Robinson and K. V. Milburn to be Majs.

Lts. N. McLeod and C. H. Johnson to be Capts.

The King has been graciously pleased to confer the Efficiency Decoration upon the following Officers under the terms of the Royal Warrant dated Sept. 23rd, 1930:—

Col. G. L. Thornton, M.C. (ret. T.A.), Hon. Col. 43rd (Wessex) Div.

Lt.-Col. and Bt. Col. R. Errington, M.C.

Lt.-Cols. E. L. Sandiland and S. J. Charlesworth Holden.

Majs. H. Shield, M.C., and J. C. MacKay, M.C.

Capt. G. W. Wright, M.M.

The principal training camps for the London troops of the Territorial Army (R.A.M.C.) this summer will be as follows: A.D.M.S., 47th Div., Arundel, and 13th General Hospital, Netley, July 28th–August 11th; 167th Fd. Ambulance, Roedean, August 4th–August 18th; 140th Fd. Ambulance, Aldershot, July 14th–28th; 47th Div. Det. 8th Hygiene Coy., Arundel, July 28th–August 11th.

ROYAL AIR FORCE

Wing-Comdr. D'A. Power, M.C., to D.M.S., Dept. of A.M.P., Air Ministry, for Medical Staff duties vice Group-Capt. A. Grant, M.B.E.

Squadron Leader F. L. White to D.M.S., Dept. of A.M.P., Air Ministry, for Medical Staff duties vice Wing-Comdr. D. McLaren.

Flight Lts. A. S. Burns to No. 99 (B) Squadron, Mildenhall; M. T. O'Reilly to Station Headquarters, Worthy Down.

Flying Offr. H. F. Harvey to No. 2 (Indian) Wing Station, Risalpur, India.

Flight Lt. T. C. Macdonald, is granted a permanent commission in this rank.

INDIAN MEDICAL SERVICE

Capts. to be Majs.: G. M. Irvine, D. Kelly, and S. D. Gupta.

Col. J. P. Cameron, C.S.I., C.I.E., *V.H.S.*, retires.

Major R. D. Cameron, M.C., R.A.M.C., is appointed officiating A.D.M.S. at New Delhi.

DEATHS IN THE SERVICES

Col. William Thomas Mould, A.M.S., who died on March 18th at Folkestone, was born at Forton, Gosport in July, 1865, the eldest son of Col. J. S. Mould, R.M.L.I. He studied at the London Horpital, qualifying M.R.C.S. L.R.C.P. in 1887, when he at once joined the R.A.M.C. He became captain in 1890, major in 1902, lt.-col. in 1912, and colonel in 1915. He served in Sierra Leone in 1898–99, in South Africa, 1900–02, in the European War he was mentioned in despatches and received the C.M.G. in 1919. He married Amy, daughter of Mr. J. O'Brien, and had one son.

The death occurred on March 18th, at Beckley, Sussex, of Lt.-Colonel James Entrican, C.I.E., I.M.S. retd. He was born in September, 1864, and qualified M.D., M.S., M.A.O. Belf. in 1887, and D.P.H. Camb. in 1896, and entered the I.M.S. in 1891. From 1903 he held civilian appointments in Burma, becoming inspector-general of civil hospitals there in 1919. He was created C.I.E. in 1922 and retired in the following year. Col. Entrican married Amy Mary, daughter of Dr. George Eugene Yarrow, barrister-at-law, and a well-known public official at Islington.

PARLIAMENTARY INTELLIGENCE

OSTEOPATHS BILL

Select Committee Inquiry

(*Continued from p. 712*)

THE Committee's inquiry continued on March 22nd and 25th with Lord AMULREE in the chair.

Lord Dawson Questions Dr. Macdonald

Dr. W. K. MACDONALD, of Edinburgh, was recalled so that questions might be put to him by Lord DAWSON. In answer to the first questions he agreed that liver was an efficient remedy for pernicious anæmia, and that patients could now be kept in reasonable health by weekly injections of liver extract. Osteopathy had nothing comparable in scientific interest to this method of treatment which the medical profession had evolved, and which was a wonderful piece of research work.

OSTEOPATHIC TREATMENT OF EPILEPSY

Lord DAWSON said that the witness had given a very interesting account of his views on epilepsy. Was there any radiographic evidence in favour of these views? Was there any record of a series of cases treated by manipulation without bromide compared with a series—say 100—treated with bromide? Were any lesions demonstrable post mortem? The witness replied that nothing had been done to provide post-mortem evidence as far as epilepsy was concerned, but post-mortem examination of lesion areas in general often revealed evidence of osteopathic changes of very long standing. What prevented the characteristics of lesions showing up in a post-mortem examination was this: When the ligaments of a joint were cracked the visible characteristics of the lesions disappeared and all that they had left was a bony change—provided that the lesion had existed long enough for this to come into being.

Lord DAWSON said he had chosen to raise the question of epilepsy because this was a common disease of great and grave public interest. Dr. Macdonald in his evidence had actually stated that the lesions were in the bones themselves, and it had occurred to him that there might be a wealth of material accumulated somewhere which would show these actual diversions from the middle line. The witness replied that in regard to cases of epilepsy he had no such evidence that he could lay before the Committee; he could state the clinical results which were obtained. It was difficult to get post-mortem and X ray evidence on this subject, but he claimed that in general it was rarely that a stereoscopic plate failed to show a lesion which was palpable to the fingers. On being pressed to state whether there was any body of evidence anywhere, systematically arranged in a manner comparable to the evidence laid before scientific societies, he said that such evidence was only available in the journal of the American Osteopathic Association. He did not know whether there was any evidence about epilepsy, but he would make it his business to find out.

ACCESS TO HOSPITALS

Lord DAWSON said he was in a peculiar position on that tribunal. He tried to be impartial, but he was a member of the same profession as Dr. Macdonald. His attitude towards osteopathy was this: he would never fail to ask an osteopath to help him with a case if he thought it was to the patient's advantage; he would allow himself no limitations. There had been a statement in the Press which had misinterpreted the position in regard to doctors who sent patients into a hospital. He himself had sent hundreds of patients to hospitals, but he had never supposed that once a patient had gone into the public ward that he should be allowed to go and be consulted about the treatment. He put it to the witness that the Press had completely misunderstood the situation when it suggested that there was something here of a special bias against osteopaths. The witness said he agreed, and would like to associate himself with what Lord Dawson had said. He was sorry that the matter had been misrepresented.

Mr. THORPE, K.C. for the promoters, said that the question which had been raised was that of a patient treated by an osteopath, and who was sent to an infectious diseases hospital. As soon as he entered the hospital his osteopathic treatment would cease, and he would have to go through the ordinary treatment. Lord Dawson agreed that this was so.

DEATH CERTIFICATES

Lord DAWSON suggested that the witness would not be satisfied with limiting the sphere of osteopathy to the very skilful manipulative treatment of sprains and hurts and joints and muscles; it was claimed that osteopathy was a system of healing covering all the ills of the human body. Dr. Macdonald replied that osteopaths claimed to be able to make themselves complete physicians, and he agreed that that was where they differed from dentists and midwives and others. Lord Dawson said that if osteopaths claimed that wide embrace it should carry with it a corresponding responsibility for all those ills, whether they were acute, chronic, medical or surgical. The witness agreed.

If that is so, would you be willing to abandon the right to sign death certificates? Would that be consistent with your professional self-respect, and would it be in the public interest?—I think it would be for the public good. I take it that until such time as we have a college running where the education of osteopathic students can be actually inspected we cannot expect to have the high privilege of signing death certificates.

But you are including in your embrace the really dangerous diseases of the human body which unfortunately carry with them definite mortality. If you are going to take the responsibility for those diseases then when there is a death there would have to be every time an inquest, would there not?—Yes.

But would that be in the public interest?—Not from the point of view of the law, no.

I put it to you, as one professional man to another, that I should see red if I had no right to sign a death certificate after struggling for weeks and weeks to save the life of a patient, and then in the end I had to submit myself to a coroner. You see the professional feeling oozing out of me—I see the righteous indignation that you feel. We feel just as righteously, and, if possible, even more vigorously, but we must have a beginning somewhere. We cannot go to Parliament—this is my own personal view—and say that we want all these privileges until we have proved to Parliament that we have educational colleges where our students can get the education necessary for those privileges. Therefore, being anxious to have some preliminary recognition, we are willing to give way on many points in order that we may have granted to us a recognised professional legalised existence.

The witness further explained that when the Bill was first brought forward it was proposed that the curriculum should be one of four years, and he could not support a claim for the right to sign death certificates on such a curriculum. He thought that the right should be granted only after five years' training. Mr. THORPE said that he was largely responsible for the clause not being pressed, but it was still before their lordships if Lord Dawson thought it would be more logical to retain it.

USE OF DRUGS BY OSTEOPATHS

Lord DAWSON maintained that it came out many times in the witness's evidence that the human body contained within itself all the means necessary for the curing of disease. To which Dr. Macdonald replied that

every time the phrase had been used while he had been in the witness chair he had taken the opportunity of correcting it. The body contained all the power necessary for the curing of disease. He could not maintain that it contained all the substances.

Lord DAWSON said that the witness had agreed that in a variety of diseases—he thought there were over twenty—drugs should be used. The list included the acute diseases, the parasitic diseases, respiratory diseases, heart disease and what were called metabolic diseases, such as pernicious anæmia. He suggested that just in proportion to the extent to which the witness would use drugs in the treatment of those diseases, he was becoming assimilated in that particular to the practice of medicine.

The WITNESS: No, we never use drugs in any acute disease, and we are of opinion, rightly or wrongly, that our handling of acute disease is superior to the drug treatment.

Over and over again, said Lord DAWSON, the witness had stated that he would use drugs in these acute diseases. Dr. Macdonald answered that he had given a list of seven conditions which he called medical emergencies. He had pointed out that, apart from the intravenous injection of saline, and the use of a heart stimulant in cases of non-toxic heart failure, all these medical emergencies were dealt with by products of the ductless glands.

Lord Dawson said that one of the things which made him almost despair of that inquiry was the difficulty which he found of getting one single fact. He had read all this evidence most carefully, and had done his best to look at it with complete impartiality. He could not get a definite answer to his questions. He had never been mixed up in an inquiry in which it was so difficult to get an answer. "I am not hostile at all," he added; "I want to be converted." The witness said he was very well aware of that.

Lord DAWSON said the witness knew quite well that he had said in his evidence that he would consider it to be his duty if he were faced with a case of diphtheria to use antidiphtheritic serum.

The WITNESS: I did.

Lord DAWSON: That is all I want.

The WITNESS: I want to point out that it is only one of the diseases.

Lord DAWSON: I went into a case of a young man in the prime of life who gets syphilis, and you at once said that you would use arsenic or mercury?—Yes.

Lord DAWSON: We are in agreement then that in certain diseases if you were up against life and death you would use other remedies than osteopathic treatment, though you would much rather push them on to someone else?

The witness said that if it was in the interest of the patient they would use them. That was a definite statement.

Lord DAWSON: You have osteopathic methods of treatment which belong to yourselves to which you attach great value which you would utilise either by themselves or with external remedies?—The WITNESS: Yes, that is a very fair statement.

THE PARALLEL OF HOMŒOPATHY

Lord DAWSON then referred to homœopathy, which he said was profoundly divergent from the methods adopted by orthodox medicine. Homœopathy was content to carry out the medical curriculum, and taught its medical tenets after qualification on the same line of curriculum, with the same examinations and the same registration as orthodox medicine. Immediately after qualification it set to work according to its own particular teaching. The witness agreed, but said that the difference of opinion between allopaths and homœopaths was entirely one of the dosage of drug treatment. There was not the basic difference which existed in the case of osteopaths as to whether drugs should be used in disease or not. Homœopaths were still inside the medical profession, and by carrying on inside the profession they had, in his opinion, killed themselves as a school of thought. Lord Dawson said that all he wished to point out about homœopathy was that though the difference in treatment between orthodox medicine and homœopathy was as great as between orthodox medicine and osteopathy, homœopaths managed to get along under the medical curriculum.

In answer to further questions by Lord DAWSON, the witness said that osteopaths claimed that what they called osteopathic lesions were the most important single cause of disease. He agreed that that was what was new, original and revolutionary in the osteopathic faith. Lord Dawson said that he took it that that more than anything else was what led osteopathy to claim to set up something which had never been set up in this country or on the continent of Europe—a system of medicine with a separate curriculum, separate examinations and separate registration. If the claim could be established he (Lord Dawson) would go in for it. He did not believe in half measures. But the setting up of such a parallel system of medicine would produce a large amount of administrative inconvenience, and this made it doubly and trebly important that a case should be made out in its favour. The witness agreed.

SCIENTIFIC TESTS OF THE THEORY

After further questions by Lord DAWSON in regard to the necessity for osteopathy proving its claims by scientific tests,

The WITNESS said: What more can we do? I have worked for 20 years with this spinal lesion as the only factor in ill-health to which I have paid attention as far as treatment is concerned. As a result of that 20 years' work I am more than satisfied that the medical profession have missed a great truth. I have produced at this inquiry, and to the council of the British Medical Association, seven bulletins on osteopathic research, but I have not been asked one single question on the scientific basis of osteopathy.

It was quite untrue, he contended, to say that there is no possibility of a scientific investigation of osteopathy.

Lord DAWSON: Who said that?—WITNESS: It is said in the statement handed to me while I have been sitting here—signed by 480 members of the medical profession. They have no ground for such a statement.

Lord DAWSON: It is a rule in scientific life that a person who puts a new theory forward has to prove it. I have about 40 cancer "cures" sent me a year. It is the business of the man who puts forward a theory to deliver the goods before his colleagues.

WITNESS: We are here before your lordships because of the effects on public opinion of our work for sick people. We have what we consider to be abundant scientific proof, and our contentions are at least worthy of scientific investigation. We think that the osteopathic case has been proved on a scientific basis, and we welcome any tribunal that will go into the scientific aspects of it.

Lord DAWSON remarked that the real question was whether osteopaths were prepared to produce evidence of an essentially scientific method—evidence which would satisfy scientific tests, apart altogether from individual experience. The witness replied that the proof was ready; but this was the first moment in this country that any responsible official person had ever been willing to investigate osteopathy.

In answer to further questions, he said that all their research work was contained in the Bulletins of the Still Research Institute and in other publications. They were prepared to take their stand on these seven Bulletins, plus two or three dozen contributed articles out of the *Journal of the American Osteopathic Association*. He would gladly marshal these for Lord DAWSON to look at.

Some Questions by the Committee

Replying to a question by Lord MARLEY, the witness said that at Los Angeles Hospital the No. 1 Unit was medical, and the No. 2 Unit was osteopathic. They were under the same general management, under the

same medical director and in the same building. No difficulty arose.

Lord ESHER: Is the Committee to understand that the medical profession has been watching successful cures by osteopathic treatment for 20 years, and that, purely on a question of etiquette, they have never examined the position for themselves? Have their scientific research people never investigated osteopathic theory?—WITNESS: I assert that they have not. If they have, they have not challenged us to produce it.

Lord ESHER: You mean that these disinterested scientists have been watching this thing take place for 20 years and have never taken the trouble to investigate it?—That is my assertion.

Lord ESHER: That seems extraordinary! Is it a question of etiquette entirely?—WITNESS: That is not for me to say. I think that was one of five or six different reasons. At any rate they have not done it.

Lord CARNOCK: Do you ever find difficulty in getting hospital-trained nurses to assist you?—No.

Lord CARNOCK: Do osteopaths certify lunatics?

Mr. THORPE, to whom the witness referred, said that osteopaths would not have the power of certification under this Bill, whatever they might have in future.

Lord CARNOCK: I see that you have some osteopaths in India?—WITNESS: Yes.

Lord CARNOCK: Supposing I was bitten by a cobra: would that be susceptible of osteopathic treatment?—Yes.

CHAIRMAN: What do you consider to be a drug from the point of view of osteopathy?—WITNESS: A drug is a chemical which is given for therapeutic purposes in order to alter the quality of the body reactions.

CHAIRMAN: Is that the drug you do not administer?—WITNESS: That is the drug we do not wish to administer. Medical treatment alters the quality of body reactions by giving things and doing things. The osteopath removes possible causes of interference with the normal reactions of the body.

Lord DAWSON: You say that a drug is something "we do not wish to administer." Do you mean that if you get the chance you would not give a drug in any circumstances? Or does it mean that if you were up against it, with full responsibility, you would use it, as in cobra poisoning or dysentery?—WITNESS: If we are to be complete physicians we must in some 20 cases give drugs. But we do not wish to give drugs.

Lord MARLEY: In point of fact, if you get these cases at an earlier stage you believe that you would be able so to improve and build up their resistance and lines of communication that they would never reach the stage when giving drugs was necessary?—WITNESS: Most essentially so. These drugs, in our contention, are only necessary—or are mostly necessary—when the disease is in its full-blown condition.

Lord MARLEY: And it would never have got to that stage if the patient had been treated earlier?—I could not say "never."

Lord DAWSON referred to diseases which might develop within 24 hours, instancing amœbic dysentery, typhoid fever and acute diabetes, and said, "In these cases you could not stop to talk about osteopathy. You have got to get down to it, or you would lose your patient."

WITNESS: Which form my No. 1 medical emergency admissions.

Lord MARLEY: If twelve people were going down the Nile and six of them developed amœbic dysentery your suggestion would be that in all probability those who did develop dysentery were in some way or other osteopathically unsound?—Yes.

PROPOSED OSTEOPATHIC COLLEGE

Replying to the CHAIRMAN the witness said that when he was at the Kirksville College, in the United States, there were about 600 osteopathic students there. There were professors of chemistry and physics, and lecturers in medicine, botany, zoology, anatomy and physiology.

CHAIRMAN: Assuming that this Bill passes—what sort of college do you propose to establish?—WITNESS: Our idea would be, in the first instance, not to bother to teach physiology, chemistry, physics, or even pathology. We should like all that taught in some available medical school. We should never allow any student to enter our college until he had passed his medical preliminary matriculation examination. Then we should give him the finish of his education.

Replying further to the CHAIRMAN the witness said that they would like their students to pass their first two years in the medical school, and after that to take only pathology at the medical school and clinical experience in hospitals. "We should like the student," he said, "to spend the first two years in the medical school and the next three years with us. We might get ten or twenty students the first year. We might get a very much larger number of post-graduates. Since I was here on Monday I have had three Edinburgh medical graduates who want to come and study osteopathy. The number will increase proportionately if we get some official recognition."

CHAIRMAN: How many teachers do you propose to employ?—WITNESS: I should think about eight lecturers and anything up to a dozen or more clinical instructors of the actual technique.

CHAIRMAN: Assuming that this Bill is passed, where would the practitioners in osteopathy come from?—WITNESS: In the first instance we should bring in members of the British Osteopathic Association, because that association does not admit to its membership people who have not the qualifications laid down by the Bill. Secondly, we should admit all members of the Incorporated Association of Osteopaths. Thirdly, under paragraph 3 of Clause 6 (1) we should admit those who have been engaged in practice for three years. After the Act passed those completing the prescribed courses would be registrable.

Replying further to the CHAIRMAN the witness said: "I think osteopaths coming from America here to practice ought to do an extra year in this college to bring them up to our requirements. He thought that about half the members of the British Osteopathic Association were American by origin, although some of them were naturalised British subjects.

CHAIRMAN: You propose then that this association, whose membership includes persons who are not naturalised British subjects, should have the power of appointing members to the Board?—WITNESS: I admit that there are members of the British Osteopathic Association who are American citizens. I have been associated with the British Osteopathic Association for many years, and I know that they are all very worthy individuals, and that as an association they have nothing at heart except the elevation of educational standards, and the right conduct and recognition of their members.

Questioned by the CHAIRMAN about the other bodies nominated for the right of appointing members to the Board, the witness said that all the members of the Incorporated Association of Osteopaths were graduates of Dr. Littlejohn's school. The Osteopathic Defence League was a lay body of men and women who were anxious to further the cause of osteopathy.

At the conclusion of his examination the WITNESS said that he wished, on behalf of his own Association, to thank their lordships for the way they had listened. He particularly thanked Lord Dawson, "who has shown a great willingness to understand us and all our heresies."

Examination of Dr. Littlejohn

Dr. JOHN MARTIN LITTLEJOHN, examined by Mr. Murphy, stated that he was dean and head of the British School of Osteopathy. He held the degree of doctor of medicine of the Dunham and Hering medical colleges of Chicago, and was a doctor of osteopathy of the Kirksville School of Osteopathy. He was educated at Glasgow University, where he took degrees in law and divinity, and was medallist in forensic medicine. He then went to the United

States, lived there for nearly twenty years, and held appointments as professor of physiology and dean of the faculty at the Kirksville School, dean of the American School of Osteopathy and professor of physiology at the National Medical School, Chicago.

BRITISH SCHOOL OF OSTEOPATHY

He established the British School of Osteopathy in 1917; it was a non-profit making institution, now supported entirely by the fees paid by its students. There were neither endowments nor voluntary contributions; no members of the staff were paid, and he himself derived no private profit from it. Since 1927 it had been controlled by a body of trustees. At present there were 45 students, and since its foundation 98 had been granted diplomas. Two of these had died, so that there were now 96 graduates of the school practising osteopathy under the school's diplomas in this country. "We state specifically in our articles," said the witness, "that we have no power to grant degrees, and we always tell graduates that they have no right to call themselves doctors of osteopathy, or to use the title of doctor. The diploma we give to them is: D.O., diplomate in osteopathy. We also tell them that if they make any statement as to where they have received their diploma they are to use 'B.S.O., London,' to specify the school from which they come." Besides those who had completed the course and graduated, 46 other students had started work but gave it up. In answer to a question the witness said that two of these were medical men, and that so far as he knew neither of them now did any osteopathic work. At Lord Dawson's suggestion he wrote down the two names on a slip of paper and handed it to the CHAIRMAN, who ruled that they should be reserved for the use of the Committee and not divulged.

The witness went on to say that the course at the school was of four years' duration—four sessions of not less than nine months each. Two years was required of medical graduates. At the time the school was started the articles of incorporation provided that students must produce either a certificate of the completion of a regular high school course, or a certificate of matriculate qualification to enter upon the study of medicine in a medical school in the United Kingdom. That was their standard of preliminary education.

At this point evidence was produced from three people, Mr. F. R. Bennet, Mrs. F. MacNought, and Mr. W. W. Hughes, regarding successful osteopathic treatment after alleged failure of ordinary medical treatment. Dr. Littlejohn was then recalled to the witness's chair.

Replying to Mr. MURPHY, counsel for the promoters, witness said his school laid down what was called in America a basic science foundation. The student was required to attend in some school or college, recognised by the medical profession, in pre-medical work, and also chemistry, biology, and physics. He (or she) had to present the evidence of having taken the second year's work in anatomy, physiology, dissection, and so forth. Students must do that before the school admitted them in the third year to its course. In the third and fourth years they attended the demonstrations on technique, diagnosis, and treatment. They were required to treat patients at the clinic under supervision of the superintendent. Yesterday they had in their clinics 97 patients; it was the daily average. One of the two clinical superintendents was always present. Dr. Littlejohn himself demonstrated, and there were six others who demonstrated. Nine demonstrations took place every week in which the patients were examined in front of the students, a careful diagnosis was made, and the line of treatment was demonstrated. The students reported to the superintendent how their patients were treated and what changes had taken place in the condition. During last year there were 18,000 patients and 24,000 treatments. In and around London there were 13 affiliated clinics at which very large numbers of treatments had been given. These were not clinics belonging to the school in the sense of being teaching clinics. They were conducted by their graduates in those areas for the benefit of people of the poorer class, but they were all under the influence of the school. If any difficult cases arose they were sent to the school for special examination and report. The school was now at Buckingham-gate, where they had a well-equipped building for their work. They would welcome the increase of the course from four to five years. It really required five years' work, because at least two and a half years was wanted for the pre-medical course, whilst the osteopathic work required three years. The five years would admit of the students acquiring knowledge and experience in the additional subjects, and it was suggested they should be taught. They did not teach either the practice of medicine or major surgery. These were in the care of the medical schools, which they trusted.

COUNSEL asked what advantage the witness saw for the passing of this Bill. The witness said there were many advantages. In the first place, it was very difficult to convince students that there was a proper field for osteopathic practice, because it had no recognition in this country. It was really marvellous in these circumstances that they had been able to get over 140 students in their school; they could hold out no prospect beyond the fact that osteopathy was demanded. Secondly, they could at present only tell their students that they must go to the medical schools and colleges to get the two years' work; they anticipated that by the Bill they would be able to co-operate with the medical schools to get their students educated there. Thirdly, all they could now give the students was the experience of an outdoor clinic; they could make no provision for indoor patients. If the Bill was passed they would either have their own hospitals, as they had in America, or there would be access to the public hospitals in some way, so that their students might get experience in acute diseases.

After submitting the list of teachers at the osteopathic school, the witness said that the only persons paid for services rendered in teaching were two clinical assistants. Some of the staff put in 1–4 hours a week, and he himself put in 12 hours.

POSITION IN UNITED STATES AND CANADA

In the United States of America the number of practising osteopaths was 8599. Osteopathy was recognised in all the States of the Union: 11 States had composite boards, partly composed of osteopaths and medical practitioners; three had medical boards with an osteopath examiner; and six had purely medical boards. It was recognised in four provinces in Canada.

Dr. Littlejohn Cross-examined

Sir WILLIAM JOWITT, K.C., leading counsel of the B.M.A., began his cross-examination by asking the witness about the medical degree obtainable at Dunham Medical College in Chicago, and the hospital experience required of candidates for it.

The witness said that the college was closed in 1908, and that there were about 80 students in his day; he could not recall the names of his teachers, but could get them if required. Clinical experience was obtained at the Cook County Hospital which belonged to no college; he worked there for two years, and it took two more years for his degree—making four years for the course. The papers he had in examinations were in midwifery, obstetrics, materia medica, and the practice of medicine and surgery. He did not remember any of the names of the examiners or of the staff of the Cook County Hospital.

COUNSEL also asked about the honorary degree of doctor of laws conferred on Dr. Littlejohn by the University of Texas. Witness replied the degree was conferred for "public work"—in political philosophy, for example. I was a fellow in political philosophy at Columbia University, New York, for two years. That was in 1892. He had never heard of diploma mills and would consider it below his dignity to pay for a degree. In answer to further

questions he said he had been concerned in teaching practically all his life, from the time he was a student in the University of Glasgow, where he had been a foundation scholar in natural philosophy. His Glasgow degrees were those of master of arts, bachelor of divinity, and bachelor of laws, and he had also studied physiology there.

Later, COUNSEL gave an account of the activities of the late Mr. Looker, an American, who established in this country schools offering the degrees of M.D. (master diagnostician) and F.B.C.S. (fellow of the British Chiropractors Society).—The witness denied knowledge of this, but agreed that before Mr. Looker died he took over some of Mr. Looker's students. They arranged to give the honour of D.O. on condition that the students took their diploma and fulfilled a certain amount of work in connexion with the school. They sent round the students a paper of questions. Asked if the students were allowed to take the papers home and in a fortnight send in the answers, the witness said that was tutorial instruction and was not examination.

COUNSEL: I strongly suspect that that was the examination that most of them passed?—WITNESS: They were supplied with a series of test papers, and along with each test paper there was a specific course of study marked out in books which they were required to read.

He was anxious, the witness continued, that no one should be turned out on the public with D.O. to his name unless he had done a full and rigorous four years' course.

AN ERROR IN A DIPLOMA

Dr. Littlejohn promised to bring the diplomas of his degrees of LL.D. and M.D. to the next sitting of the Committee; and on Monday he produced a number of documents including a medical diploma granted to him by Dunham College, Chicago, U.S.A., in 1902.

COUNSEL pointed out that on this the witness was described as a doctor of philosophy, and asked if he actually had that degree. Dr. Littlejohn said he had not, and suggested that it might have been a mistake made in making out the diploma. Asked how he explained the mistake witness said that he had not noticed it until yesterday. If he had noticed it before he would have corrected it.

Have you ever described yourself as a doctor of philosophy?—Not that I know of.

Reading from a booklet issued by the British School of Osteopathy, COUNSEL pointed out that among the degrees possessed by the witness as stated there was the degree Ph.D., dated 1894. Dr. Littlejohn said that that was a mistake. It was put in on the basis of a thesis he had written on political theory.

THE WITNESS'S MEDICAL EXPERIENCE

Answering further questions, the witness said that he was president of the Chicago College of Osteopathy and hospital from 1900 to 1913 in which latter year he returned to England. He was professor of physiology in Dunham College for two years, and he taught applied physiology in the National Medical University of Chicago from 1904 to 1906. He agreed that he had been professor of physiology at Dunham College before he got his medical degree, but pointed out that there were professors of physiology in this country who were not doctors of medicine.

Down to the end of 1897 had you had any sort of medical or osteopathic training at all?—No.

But I find that in 1898 you became dean and professor of the American School of Osteopathy. Is that right?—Yes, sir.

Pressed further for an explanation, the witness said that he had had his scientific training in the University of Glasgow long years before in chemistry and elementary physiology under Prof. McKendrick. He had also attended the Anderson Medical College, where he took both anatomy and physiology. He went to America for health reasons, as a result of an accident and on medical advice.

COUNSEL asked the witness to explain how he could pretend to be qualified to take up the position as dean and professor of the American College of Osteopathy in 1898. The witness replied that he was president of a college which was much larger than Kirksville at the time that he went to the American School of Osteopathy. If he was capable to discharge the duties of president of such a college, he contended that he was certainly capable to hold the position of dean of the American School of Osteopathy.

MORE ABOUT THE BRITISH SCHOOL

Continuing, the witness said that he was now dean of the British School of Osteopathy. There were to-day 45 students of whom 9 or 10, he believed, were attending, or had attended, a medical school. Among the students who had attended in the past, 26 students had had a two years' course in medicine. Records were kept to show that the students actually had attended the medical schools. Since the beginning of 1934 the British School of Osteopathy had required its students to pass the pre-medical examination, and also the first professional examination.

In reply to further questions, witness said that a student who had matriculated went to another college for chemistry, physics and biology during his first year, putting in four hours per week at the British School of Osteopathy for teaching in the basic principles of applied anatomy and diagnosis.

Sir WILLIAM JOWITT: Would it be honest, if a man had attended two years at some reputable medical school and then had come to your school for two years only, for you to give him a certificate to say that he had attended lectures at your school and been to your school for four years?—WITNESS: We do not give such a certificate.

Sir WILLIAM JOWITT then referred to a man named George Spencer, who, the witness agreed, had been a Looker student and afterwards went to the British School of Osteopathy for one year. Sir William read out a certificate issued to this man by the British School of Osteopathy, in which it was stated that George Spencer "having completed the required studies and attended the full courses of lectures, clinics and demonstrations during the regular four years' course, and having passed satisfactory examinations in all branches of training taught in this school, including clinics and other practical demonstrations, is hereby admitted to the diplomate in osteopathy, D.O. . . ." "Is that an honest document?" asked Sir William.—Witness: "Yes, it is."

The witness went on to say that here they were taking in a student who had given evidence that he had completed three years of work in an irregular school. They had required him to take one year's work, and pass their examinations—and it was on that basis that they gave him and others their diploma. In 1926 a certain number of graduates of the Looker School of Osteopathy and Chiropractic who had formed an association called The Incorporated Association of Osteopaths, Ltd., applied for admission to the British School of Osteopathy to get credit for the work they had done at an irregular school. They took them in and gave them credit for the work they had done irregularly for three years. These students were required to complete one year's work and take their final examination at the British School of Osteopathy. That was always the principle adopted by the associated colleges in America.

Sir W. JOWITT: Do you not say in this diploma that the man has done a four years' course at your school?—WITNESS: No. It means that he passed in the subjects taught in the school, though he did not pass all the time in the school.

Sir W. JOWITT: Do you know that Looker students get their diplomas, not only in osteopathy but also in chiropractic as a result of a six months' course?—In chiropractic, yes.

Sir W. JOWITT: And in osteopathy too?—WITNESS: I do not know. I do not know anything about the school apart from the information conveyed to me.

Sir W. JOWITT: Is it not the fact that a student might

get his diploma in osteopathy and chiropractic from the Looker College of Osteopathy and Chiropractic on the strength of a six months' course—and a correspondence course to boot?—WITNESS: I cannot answer that question.

Sir WILLIAM JOWITT said later: I suggest to you that to say that students now going through their first two years at your school are attending medical colleges is not true, and I challenge you to prove that they do, if you desire to do so, to show that my statement is wrong.—WITNESS: Those now attending our first year are attending medical schools.

Sir W. JOWITT suggested that perhaps the witness would like to write down and hand to their lordships the names of such students and the medical schools they were attending. The witness was understood to say that he would do so.

Lord ESHER: What suddenly enabled you to get your students into the medical colleges?—WITNESS: We have been trying for quite a long time to make some arrangements with the medical colleges.

Lord ESHER: And now you have made it?—No, we have made no arrangement.

Replying further to Sir William Jowitt about third and fourth year work at the school, the witness said that they had no X ray apparatus at the school. They taught their students simply to read and interpret X ray photographs. They had a small laboratory for testing urine, blood examination, microscopic examination and so on. The fees charged to students were 75 guineas a year. They had a specialist member of the staff, Mr. Canning, who gave teaching on the ear, nose and throat.

Sir W. JOWITT: Who does the eye?—WITNESS: I do the eye myself.

Are you a specialist on the eye?—Osteopathically, yes.

But you are claiming that students at this school should be qualified to treat all diseases. Take a disease like cataract.—That is sent immediately to a surgeon.

Who teaches about genito-urinary diseases?—Mr. Tangey.

Who specialises in skin diseases?—I do.

Then you do minor surgery, bandaging, minor surgical technique, clinical technique and practice, osteopathic orthopædics, obstetrics and gynæcology. Who teaches that?—Miss Foggett.

And medical jurisprudence?—That is simply a course of lectures which I give to the students indicating to them their legal responsibility and so forth.

TEN THOUSAND MICROSCOPE SLIDES

In further reply to Counsel, the witness said that the 96 persons to whom he had referred had no opportunity of getting laboratory training before entering the examination. The school was equipped, however, for taking various tests, and they had some 10,000 microscopic slides of pathological conditions, which the students were required to examine. The school was not equipped as it should be for laboratory instruction.

In reply to further questions, witness said that all the 96 students succeeded in passing the examinations of the school in pathology, as well as in other subjects, and in acquiring the diploma issued by the school though not all at the first attempt.

COUNSEL: Is it not plain that the British Osteopathic Association would not recognise your diploma?—It might be.

Do you know it?—Unofficially.

Nobody in America has recognised your diploma?—Not in America. They have not been asked to. I do not think it would be an advantage, because none of our men want to go to America. Ours is a British association, and we want recognition in this country.

The witness stated that they taught their graduates the theory of acute diseases, but with regard to the practice they had no means of demonstrating as they had no hospitals. He agreed that practical experience was absolutely necessary. They were hoping to get access to the existing hospitals, and if not, to found their own hospital. He believed they could raise money to equip a thoroughly good hospital. That was the way they started in America, where he himself had started a hospital.

COUNSEL: Will that be an hospital to receive and treat acute diseases?—The WITNESS: If we get recognition, I hope so.

Lord DAWSON questioned the witness closely regarding the 10,000 slides at the school. The witness said they had a large collection of bacteriological slides dealing with infectious diseases. They had specimens of every form of bacteria. They did not take their own specimens, the slides being imported from without.

Lord DAWSON asked whether evidence could be produced of a pathological sort that demonstrates the presence of osteopathic lesions. Among the 10,000 slides there were some that would demonstrate the view that the osteopathic lesion is the most important single factor in the causation of disease?

Witness said that none of the slides provided evidence in support of this view, which was based on clinical experience and the researches of osteopathy.

In answer to further questions, witness said that in the absence of laboratory facilities when cases of pernicious anæmia or diabetes were discovered among the patients attending the clinic at this school they were referred to specialist physicians.

Witness agreed to allow Lord Dawson to see the diagnosis made in the 18,000 cases, and 24,000 treatments at the school's clinic last year. Asked if there was any evidence he could produce of X ray pictures showing osteopathic lesions in cases of epilepsy or pernicious anæmia, the witness said they had X rayed many cases of epilepsy, showing various kinds of lesions.

Viscount ESHER: You noticed this morning that learned counsel was trying to throw doubt on your qualifications and on the qualifications of your students. Supposing those doubts are justified would you consider that an argument against the Bill?—I would not.

In fact, supposing those doubts as to your qualifications and the qualifications of your students are right, it would be all the more necessary to have this Bill?—Yes. That is the object that we have in supporting this Bill, so that we may be pulled up to a standard, and we will live up to it.

Re-examined by Mr. H. L. MURPHY for the promoters, the witness recapitulated the details of his collegiate career, at Glasgow and Columbia University. The three degrees he took at Glasgow were Master of Arts, Bachelor of Divinity, and Bachelor of Laws. With regard to Dunham Medical College ceasing to insist, that was due to its being incorporated with another college in the same city.

Counsel for the promoters then intimated that this concluded the evidence which without reiteration they felt it was useful to place before the Committee.

CASE AGAINST THE BILL

Mr. DICKENS, representing the British Medical Association, said that they were prepared to bring Sir Henry Brackenbury, ex-Chairman of Council, to impress on the Committee the considerations from a social and national point of view, and the consequences that would follow if the Bill were approved. That was without regard to the question of the truth of the theory which the osteopaths held. The witnesses for the British Medical Association in their evidence would be actuated by the good of the State and the general public, and not by any prejudice as members of the profession. As, however, the case had inevitably drifted into the consideration of the value of what was called the osteopathic concept, and the Committee had heard a good deal of evidence on one side, their lordships would be anxious to hear evidence on the other. A statement had been put in by 800 gentlemen who were engaged in the teaching of the science or art of healing. They had appointed five gentlemen as their representatives to give evidence. They were not represented by counsel.

Lord DAWSON called attention to the inconvenience

of this arrangement, pointing out that Dr. Macdonald had offered to supply seven books, supplemented with other documents, which would take about a week to collect, and which would constitute a body of evidence on which the osteopathic concept was founded. He had hoped that the representatives of the teachers of science, especially the professors of pathology and physiology, would have been specially available for putting questions when members of the Committee had studied the grounds upon which the osteopathic concept was founded. It was agreed that the first two of the five representatives, Sir Farquhar Buzzard and Prof. G. E. Gask, would proceed to give evidence.

Sir Farquhar Buzzard's Evidence

Sir FARQUHAR BUZZARD, who was the first witness for the opposition to the Bill, then took his place in the witness's chair, and read the following statement signed by those for whom he spoke.

STATEMENT BY UNIVERSITY TEACHERS

1. The signatories to this Statement are engaged, as university professors and lecturers, in research and in teaching in the fields of biological and medical science. Many of them are not engaged in medical practice, and a number are without medical qualifications. The tenure of their posts commits them to no particular scientific theories or conceptions: on the contrary, they enjoy the intellectual freedom that is characteristic of British universities.

2. The practice of medicine and surgery is based on our knowledge of the anatomy, physiology, and pathology of the human body which is the product of careful and often brilliant research in the past, which is always growing and which involves, for its understanding, an intimate acquaintance with the elementary principles of such other sciences as biology, chemistry, and physics. For this reason the medical student, in the period of the six, seven, or more years which precedes his qualification to practise, is the pupil of teachers in all these subjects. In other words, the medical curriculum is designed not only to equip a student for his vocation but to give him a scientific education such as will enable him to keep pace with the constant progress of knowledge and with the changes of practice in the profession of his adoption. More than that, his training should make him an intelligent critic of new theories, and competent, with the safety of the public at heart, to adopt or reject them according to his judgment.

3. In the laboratories of the universities, workers are constantly engaged in the examination of current doctrines and theories and in the testing of new propositions. No hypothesis which is supported by evidence capable of scientific investigation is rejected without careful and disinterested exploration and experiment by men and women adequately equipped by knowledge and experience. There is nothing to prevent—indeed, there is all to encourage—the recognition and acceptance of a doctrine or theory based on truth. In short, the aim of scientific workers is the discovery of truth, not the advancement of a particular doctrine or notion.

4. The theory of "osteopathy" with its conception of the "osteopathic lesion" as the primary cause of disease is unsupported by scientific evidence. No biologist, anatomist, physiologist, or pathologist, of a British university has observed this "osteopathic lesion," and no evidence capable of verification has been brought forward. If this "lesion" exists, it is unbelievable that it has escaped the observation of the workers in these sciences and that evidence of scientific value cannot be brought forward in support.

5. Biological and medical sciences progress steadily as the result of research and discoveries, and the teaching of our universities is changed or amplified from time to time in the light of increased knowledge. The fundamental conceptions of these sciences are based on carefully controlled observations which have stood the test of time—and it is these fundamentals that osteopathy controverts. If the osteopathic theory, based on the idea that a single cause, or "lesion," is responsible for all or most disease, is true, the university authorities should, logically, supplant the teachers in their scientific and medical faculties by disciples of the osteopathic faith. There can be no compromise; the theories of medical science and of osteopathy are incompatible and contradictory.

6. It is clear from the above statements that official recognition of osteopathy as a theory of medicine completely opposed to the teaching in British universities, and indeed of universities throughout the civilised world, would create far-reaching and revolutionary changes in scientific medical and biological education.

Sir FARQUHAR BUZZARD said he was one of five witnesses, representing some 800 men and women, who were engaged in teaching biological and medical sciences to students in the medical schools of most of the universities in England, Scotland, Wales, and Northern Ireland. A great many of those who had signed the statement were not engaged in medical practice, and a number were without medical qualifications. Among them there were 23 Fellows of the Royal Society, 40 doctors of philosophy, 75 doctors of science, and 100 masters and bachelors of science. The passage of this Bill into law would not affect any of them personally, and their objections to the Bill were based on (1) its menace to the interests of the public, and (2) its menace to the prestige of scientific medicine in this country in the eyes of the world.

EFFECT OF AMENDMENTS

With regard to the amendments to the Bill, as they affected the original position of the Bill, there was the introduction of a definition of osteopathy—"That system of the healing art which places the chief emphasis on the structural integrity of the body mechanism as being the most important single factor to maintain the well-being of the organism in health and disease." If by "structural integrity" was meant the integrity of every atom of the body mechanism, or perhaps even of every cell, this definition was a platitude which did not distinguish osteopathy from any other conceivable system of the healing art. If that was not the meaning it would be necessary to define "structure" and if, as seemed probable from the writings and sayings of osteopaths, structure here referred chiefly to bones and joints, the emphasis on their structural integrity as being the most important single factor to maintain the well-being of the organism in health and disease was merely a matter of opinion. There were, for instance, a great many unqualified practitioners of the healing art who regarded the administration of herbs as the most important factor in the maintenance of well-being. On the other hand, there was probably a difference of opinion among doctors as to what was the most important "single factor." Some might plead for a diet rich in vitamins, and others for a daily evacuation of the bowels. No one would put drugs in that position.

This Bill, however, was designed to establish a system of the healing art, the basic principle of which must be accepted without question by its students before they had had any scientific or medical training. No medical student was asked to do this; he was put through a course of scientific and medical training, far more thorough than that contemplated in this Bill, and was then free to form his own opinion in regard to what was the most important single factor, if he cared to bind himself to such a generalisation, and to base his practice on his own opinion. If he came to the conclusion that the osteopathic idea of the structural integrity of the body mechanism was the right one he was in a position to treat his patients by manipulative methods.

The fact that thousands of students all over the world had received and were receiving a medical education in which there was no attempt to implant any particular doctrine of pathology or treatment, and that only a minute fraction of such students finally adopted osteopathy as their guiding principle, was one worthy of consideration. Scientific education would entirely fail in its object if the student were not allowed to form his own opinion of the facts and theories which had been placed before him in the course of his studies.

There had been from time immemorial cults of

various names, coming and going, of varying longevity, each with its newly discovered most *important single factor* in regard to the maintenance of health and the cure of disease. If anyone had travelled in America, as he had done in recent years, he would be convinced that the doctrine of osteopathy was dying in the country of its birth.

One could not estimate the value of any cult of healing by the number of grateful patients who were ready to testify to the skill of their healers. Any cult at any age could produce a number of grateful patients.

With regard to the amendment that an osteopath shall not administer general anæsthetics, nor perform major surgery, nor practise midwifery, Sir Farquhar said the opinion had been expressed more than once that it was a waste of time for the student to study those methods of treatment which he did not propose to use in his practice. The implications of such an opinion in regard to the study of materia medica and pharmacology had already been exposed. He would point out that a student who is ignorant of anæsthetics and their effect upon the tone of muscles, for instance, would become dangerous as a manipulator, that a student who knows nothing about obstetrics and the structural changes brought about by pregnancy in woman should never be entrusted with the manipulation of such a patient, and, thirdly, that a student who has not studied major surgery, much less performed it, is not in a position to know when the skill of the surgeon is essential to his patient's survival. The amendment which provided for adding to the Board a registered medical practitioner appointed by the General Medical Council, would, in his opinion, add enormously to the danger of this Bill as regards the public, which would assume that there was general recognition of osteopathy not only by the government of their country, but also by the medical profession. With reference to the principles underlying medical education, and the reference to so-called orthodox subjects, and the way they were taught, there were misunderstandings that ought to be corrected. The medical curriculum when it included the necessary preliminary education in biology, chemistry, and physics occupied at least six years, and in some cases seven or more. Under the Bill the osteopathic student had to satisfy the authorities that he was of good general education, and had four years to acquire that amount of knowledge which the medical student had to acquire in six or seven years before he was qualified. He saw in the Bill no provision of time for the study of biology, chemistry, and physics.

(In answer to a question Sir Farquhar distinguished between organic chemistry, which was provided for in the proposed curriculum, and inorganic chemistry, which was not.)

Osteopaths insisted that a high degree of skill and experience was required. If that was to be obtained in four years it must be at the expense of what was more important to the student, and that was in acquiring knowledge of disease which would make him efficient in diagnosis. If the medical student after qualification wished to devote his energy to any particular method of treatment—major surgery, manipulative surgery, or radiology—he turned to such subjects after passing his final examination. After explaining the ground work of the medical student's knowledge, including acquaintance with a number of theories, many of which could not be proved, and to which the student was not asked to commit himself, he said that emphasis must be laid on every effort being made to make the student skilful in diagnosis. A great deal of misunderstanding appeared to be rife in regard to the time and labour spent by medical students in learning about drugs. Special instruction in that subject was limited, and the student acquired his knowledge of the use of drugs mainly from observing how and when his teachers employed them. He was expected to be well versed in the use of drugs which are specifics and to have a general acquaintance with those drugs which are used as palliatives, narcotics, and correctives. The medical profession had long ceased to regard drugs as the most important single factor in maintaining health and combating disease. In this connexion he pointed out that Prof. Castlio in his book on the "Principles of Osteopathy" said: "Among the classes of chemical agents that the osteopathic physician will find useful or indispensable are the antiseptics, anæsthetics, stimulants, sedatives, anodynes, cathartics, and narcotics." This list embraced all the drugs which are used by medical men and women in their practice.

The witness proceeded to criticise in detail a number of other passages in Prof. Castlio's book. He said he was still in the dark as to what an osteopathic lesion was, and he was amazed at the ignorance displayed in regard to the physiology and pathology of the spinal cord which figured so prominently in the osteopathic writings regarding the effects of the spinal lesion on the spinal cord. For example, in Bulletin No. 1, A. T. Still Research Institute (p. 47), a photograph of a section of the spinal cord purporting to show the effects of the osteopathic lesion on an area near the tip of the posterior horn was really a photograph of the base of the anterior horn, and moreover the abnormalities described in the legend did not exist.

NOTES ON CURRENT TOPICS

Health Services: Mortality-rates

IN the House of Commons on March 25th, on the motion for the second reading of the Consolidated Fund (No. 2) Bill,

Mr. RHYS DAVIES called attention to the health services, with particular reference to infantile and maternal mortality-rates and the position of unemployed persons who had lost their health insurance and pension rights.

In the subsequent debate,

Dr. O'DONOVAN said that there was need in discussing the question of obstetrics to have a certain care in the use of words. For Members of that House to talk about admissions of failure in the care of parturient women might have ill-effects which the speakers might have hardly considered. The reports of the debates in the Press were read by many young pregnant women, whose nervous tone had not always the stability of the toughened men and women politicians. There was no question that if there was too much and too morbid discussion in public assemblies with regard to the unescapable risks of pregnancy, there would grow up a widespread anti-conception practice such as was never dreamed of when Ignaz Phillip Semelweiss discovered the cause and prevention of contagious puerperal sepsis about 1850. Since he (Dr. O'Donovan) was a student he had read many reports about the morbidity of pregnant women, and it was sometimes a source of astonishment to him that practitioners had stood up so manfully to their work. After having been shrewishly scolded and condemned as being untrained and incompetent, they had stuck night and day to their obligation of assisting women in the most difficult period of their lives. That day he had noticed with pleasure a welcome change in the tone of the discussion. The doctors were no longer *particeps criminis*, but it was strange that so many lay interveners had said that the doctors' knowledge was incomplete, that they needed more research, and more training. Yet if they were to be trained more and more on incomplete and untrustworthy facts and opinions, the results could not be anything but unsatisfactory. He did not wish the House to get the impression that their students were untrained and that new knowledge was not pursued with the utmost vigour. Dr. O'Donovan proceeded to describe in detail the conditions under which students were trained in obstetrics, and spoke of the advance which medicine and surgery had played. He said that the responsibility in the end was not that of Whitehall

officials or the Government chiefs. It was unescapably the responsibility of the medical profession. The present Government and the L.C.C. had given generous assistance to the establishment of the post-graduate school of medical studies at Hammersmith, and if there was any demand for gynæcological clinics it was to be hoped that the Government would hold its hand and let the medical profession first produce competent gynæcologists before they scattered gynæcological clinics all over the country. New buildings, devoted nurses, and equipment did not make competent doctors, and unless they had first-class gynæcologists to start with, gynæcological clinics would be little more than disinfected first-aid stations. Competent men with trained first-class brains were wanted, not clinics, for that word could cover a multitude of incompetencies. The College of Obstetricians had received a Charter since the war in order that those who taught this special subject might be able to meet and discuss such problems and give diplomas of special competency to those who would be assisting in future to man the establishment of gynæcological clinics. At the Royal Society of Medicine all the teachers of and specialists in obstetrics met regularly, and such knowledge and experience as they had acquired were interchanged with the utmost freedom. There was no monopoly of obstetric knowledge in London; it was distributed from there to teaching centres throughout the Empire, and was reciprocally received. Then, again, the British Medical Association held annual meetings, at which it invited the leading authorities and those who had done notable research in the last few years to address the whole profession on the results of their work. Not content with that, it had a system by which it sent specialists in this work up and down the country to lecture at professional meetings, so that what advance was made in the teaching centres was rapidly brought into the homes of the general practitioners and into the bedrooms of their patients. Their work was hampered by the ever-changing social aspect of married life, which had become different from what nature intended, and if there were practices unnatural or criminal, which were not willingly disclosed to the practitioner, no amount of notification of puerperal morbidity would assist in finding the cause of the trouble. A review of our social life was needed, and a frank recognition of the way in which married people lived. Then we should see whether or not the problem was entirely medical, or whether it was also one of quack abortionists and of lay interference with natural processes of conception. This problem was not only an English problem. Doctors throughout the world were concerned with it, and it was discussed at international conferences on professional papers in all languages. The English doctors attended these international conferences and read the papers presented there, many of them in languages which they could translate, and others which were prepared in abstract form for them in their special journals. The whole medical profession was concentrating on these problems in both their medical and social aspects, and even the eugenic aspect had not been neglected in the councils of the profession. He wished the House to feel assured that, as far as men could do it, his profession were applying their minds, hearts, and souls constantly and watchfully to the care of women, and the profession might feel sure, he thought, that should they ask as a profession for administrative help, that would not be the House or the Government which would refuse it.

After further debate,

Mr. SHAKESPEARE, Parliamentary Secretary to the Ministry of Health, said that although figures for tuberculosis in Wales were higher than in England, over the last decade there had been a notable fall. The death-rate per 1,000,000 of the population had come down from 1,171 in 1924 to 986 in 1933, and in the last three years the average death-rate had been below the figure of one per 1,000. There had been two special inquiries into the incidence of tuberculosis in Wales, but he would suggest to the Welsh Board of Health that they should see whether advantage might be taken of any further information in their possession. The question of national mortality was one which needed constant care and supervision

The Government, in dealing with the problem, were trying a general attack over the whole country. In October they issued a circular asking all the maternity and child welfare authorities to survey urgently their services. So far the result had been satisfactory. Of the 421 authorities, 155 had replied that they were taking steps to improve or to extend their services; 174 had reported that they did not propose improvements, but in only 23 of those cases were the services regarded as not reasonably complete; and 84 promised attention. He need hardly say that the Ministry was in touch with every authority which admitted that improvement was necessary, either by correspondence by interviews with the Department, or by inspectors on the spot. This general attack over the whole ground of the maternity and child welfare service would be carried on week by week throughout this year. Something more than that was necessary. In the circular they directed a special attack on the black areas, where the figures showed that for some reason or other there was an abnormally high maternal mortality rate. It was clear that if they could find out the reasons in those areas, and take effective steps to remedy them, the percentage would appreciably fall. The black areas consisted of 14 counties and 22 county boroughs. They had asked the medical officers of health to make an uregnt report to the Ministry covering these points: What improvement of the ante-natal service was necessary; the measures taken in the district for the provision of a midwifery service for all confinements, and the provision of adequate beds for complicated cases in hospitals; the steps taken for the isolation of cases of puerperal sepsis, and arrangements for consultant services in difficult cases. When they received those reports they would have the advantage of the services of an eminent obstetrician, not of the Ministry of Health, They sent down to each of these areas two inspectors from the Ministry of Health, one a medical officer, with an administrative knowledge of this question and the other a lady doctor with a long experience of the maternity side. These two, together with the medical officer on the spot, went into the report and found out where were the weak places in the provision of these services. They had already dealt in this way with Blackpool, Wigan, Plymouth and Wakefield, and they always had a check borough so that they could make comparisons. Visits were in progress in the county boroughs of Preston, Barnsley and Dewsbury. As regards South Wales, where the black spots were in two counties, special inquiries were being made in Carmarthenshire and Denbighshire, and an inquiry into Monmouthshire was in progress. Towards the end of the year they hoped to consolidate all these reports and to issue a report.

The report of the Joint Council of Midwives was a most valuable document, and the mere composition of the Council meant that any government must of necessity give it the most careful consideration. As soon as they received it the Department got into touch with the representative associations of local authorities, the County Council Association, the Association of Municipal Corporations and the London County Council, and asked them to furnish their views. Meanwhile in the Department they were giving it special study. More than that he could not say, except that everyone agreed that if they were to get the right person into the midwifery service, they must do something to raise the dignity and status of that great profession, and see that there was an adequate salary attaching to this most noble of all work. The training of medical students had been considered by the General Medical Council, and recently the curriculum had been strengthened to see that there was a more extensive course of training and examination given to the students in midwifery. He understood that the Central Council of Midwives were considering

the same thing, and he expected that shortly an agreement would be reached by which the course of training of midwives would be extended and improved.

With regard to the relation of malnutrition to maternal mortality, common sense would dictate that if a woman was ill-nourished she would be less able to bear the shock of childbirth than the woman who was well-nourished. The medical evidence that they had, strangely enough and somewhat mysteriously, did not support the common-sense point of view. Indeed, the most expert survey undertaken by the Departmental Committee in 1932, which examined in great detail a large number of cases, came to the conclusion that at least half the cases of maternal mortality occurred where there was no poverty at all. That was one of the things which baffled all investigators, and made it quite impossible to deal with this as a matter of poverty. They would not cease from their labours until the highest figures decreased and compared favourably with the low figures which obtained in those areas where there was first-class supervision.

With regard to health insurance, it should be noted that the figures which had been given of the exit from insurance covered others than those who had left insurance on account of unemployment. Whatever the figure was, not one of these persons had been jeopardised in pension rights, and their pension rights were safeguarded until the end of this year. The report of the Government Actuary would be presented very shortly, but the Government had already decided that steps must be taken to mitigate the hardship that would be involved if these persons were deprived of their pension rights. The Government had decided that the existing arrangements must be modified, and legislation would be introduced as soon as the Ministry had had time to consider the Actuary's report. The scope of the legislation must depend on the report of the Government actuary, and when they got that they would consider the whole question and bring legislation before the House without a minute's delay, because they were convinced of the gravity of the situation. The question of arrears was also being earnestly considered. They would do their best to find a solution which would not put an undue burden on the approved societies.

The Bill was then read a second time.

HOUSE OF COMMONS

WEDNESDAY, MARCH 20TH

Public Assistance and Care of Children in Scotland

Mr. BURNETT asked the Secretary of State for Scotland whether it was the intention of the Department of Health for Scotland, under Public Assistance Circular No. 40, that a child under order of court should be committed to the care not of a public assistance committee but of an education authority; and if he would take into consideration the fact that public assistance committees had arrangements under which children could be cared for and boarded out, whereas education committees had as a rule no other course open to them than to send children so committed to their care to an approved school.—The Lord ADVOCATE replied: In regard to the first part of the question, the Children and Young Persons (Scotland) Act, 1932, contains no provision authorising the committal of children to the care of public assistance committees. With reference to the second part, a child committed to the care of an education authority cannot be sent to an approved school without a further order by a court. Education authorities have power to board out children committed to their care under the Act. Sixteen of the authorities have intimated their willingness to undertake this duty, and six of them have already boarded out 35 children committed to their care.

A Death from Asbestosis

Mr. THORNE asked the Home Secretary if he had received a report from his factory inspector in connexion with the death of a young man from asbestosis who was employed at Dick's Asbestos Works, Canning Town; and whether the factory inspector was satisfied that proper and adequate dust-suction machinery was installed for the removal of asbestos dust.—Sir JOHN GILMOUR replied: Yes, sir. It would appear from the evidence at the inquest that death was due to asbestosis but that the disease had been contracted some years ago before the present regulations came into force. During the last 3½ years the deceased seems to have been employed at the works mentioned for about two months only. The inspector reports that the requirements as to provision of mechanical exhaust draught are well observed.

Maternal Mortality Figures

Sir FRANCIS FREMANTLE asked the Minister of Health if he had seen the official statement by Mr. Hughes, Federal Minister of Health of Australia, that the Australian maternal mortality-rate was 5·57 per 1000, and that the English rate, if compiled on the same basis as the Australian, would be higher; and whether he would give the figures for this country compiled on the same basis as the Australian figure above mentioned.—Mr. SHAKESPEARE, Parliamentary Secretary to the Ministry of Health, replied: My right hon. friend has seen a report in the press to the effect of the first part of the question, but the statement as to comparative rates in the two countries was not attributed to the Federal Minister of Health. There are known to be certain differences in the basis of calculation in the two countries, and my right hon. friend doubts whether it is possible to establish the true relation between the English and Australian rates without much fuller comparison than has hitherto been made between the English and Australian procedure at all stages in the preparation of maternal mortality statistics.

Sir F. FREMANTLE: Is nothing being done to get a system by which we can compare these figures with different parts of the Empire?

Mr. SHAKESPEARE: No, so far as I know.

Milk-borne Scarlet Fever

Mr. THORNE asked the Minister of Health if he had received a report from his inspector in connexion with the scarlet fever outbreak at Denham, Bucks; the number of children affected; whether adjacent schools had been closed on account of the epidemic; and what action was being taken to prevent the outbreak spreading.—Mr. SHAKESPEARE replied: My right hon. friend has now received a report from his medical officer on this outbreak. The number of children affected is 81. Only the two elementary schools affected have been closed on account of the outbreak. The outbreak was found to be due to the consumption of raw milk, which had been neither pasteurised nor boiled, and the medical officer of health at once arranged for the pasteurisation of all further milk from the dairy concerned. This precaution effected the immediate arrest of the outbreak. The source of the infection of the milk was later traced to a milker on a farm supplying the dairy, and he was removed to the isolation hospital for observation. My right hon. friend is advised that adequate precautions have been taken to prevent any further spread of the infection.

Mr. T. WILLIAMS: Can the hon. Member tell us exactly what action the Minister of Health and the Minister of Agriculture are taking to put into operation the recommendation of the Hopkins report in regard to infected milk?

Mr. SHAKESPEARE: The hon. Member said that a very big issue is involved on that report, and I hope he will allow some time for its consideration.

Bug-infestation of Barracks in Egypt

Sir ARNOLD WILSON asked the Financial Secretary to the War Office whether his attention had been drawn to the infestation of barracks in Egypt, Gibraltar, China and Malta by bugs, and the statement made in the Report on the Health of the Army for 1932 that they were a source of great irritation, particularly to young soldiers; and what, if any, steps were in contemplation to provide better accommodation, particularly in Egypt where no improvement could be expected so long as existing buildings were in use.—Mr. DOUGLAS HACKING replied: Perhaps my hon. friend will refer to the Report on the Health of the Army for 1933, which shows the varying success which has attended experiments to rid infested barracks and quarters

of this pest. The problem, however, is a very difficult one, and the only satisfactory solution lies in the replacement of hutted structures and the modernisation of old-fashioned permanent buildings, which is being done as funds become available. At the present time extensive schemes are in contemplation in China and Egypt.

Sir A. WILSON: Is there any prospect of similar schemes in Malta?—Mr. HACKING: No, sir. I do not think so—not in this financial year.

Dental Treatment in the Army

Sir ARNOLD WILSON asked the Financial Secretary to the War Office whether his attention had been called to the statement of the Director-General of Army Medical Services in his Annual Report on the Health of the Army for 1932, that dental care of the women and children of serving soldiers was inferior to that available in civil life, owing to financial stringency precluding the appointment of more dental officers; and what steps were in contemplation in this connection.—Mr. HACKING replied: The Army Council are aware of the situation, and it is their intention to provide for regular inspection and treatment of all children attending Army schools when financial considerations permit of the necessary increase in expenditure on dental officers, materials, etc. The wives and children of soldiers are, of course, already eligible for such dental treatment as the officers of the Dental Corps can give them at their surgeries, and I think that the report which my hon. friend is quoting was a little too modest in suggesting that the wife in civil life has better opportunities of free treatment.

A National Laboratory Service

Sir ERNEST GRAHAM-LITTLE asked the Minister of Health if he was aware that, under the present regulations governing benefit for persons insured under the National Health Insurance Acts, no facilities were provided enabling medical practitioners having the care of such patients to apply laboratory procedures, either in the diagnosis of disease for the direction of treatment along the most effective lines, or in making the best possible use of many modern advances in medical knowledge; and if he would make provision for such a laboratory service at an early date.—Sir HILTON YOUNG replied: I am, of course, aware that diagnostic facilities of the kind referred to are not provided for insured persons as part of medical benefit under the National Health Insurance Acts. Such facilities are, however, widely available through the agency of hospitals and other institutions, and I cannot hold out any immediate prospect of the extension of the scope of medical benefit in this direction.

MONDAY, MARCH 25TH

Unemployed Women and Pregnancy

Major HILLS asked the Minister of Health whether an insured woman who was unable to follow her occupation on account of pregnancy, but was not certified under the National Health Insurance Acts as being incapable of work, was treated as eligible for unemployment benefit.—Mr. R. S. HUDSON, Parliamentary Secretary to the Ministry of Labour, who replied, said: Each case is dealt with in the light of its circumstances, but I am not aware that there is any gap between national health and unemployment insurance in such cases. Perhaps my hon. and gallant friend will let me have details of any particular case he has in mind.

TUESDAY, MARCH 26TH

Coroners and Post-mortem Examinations

Mr. GROVES asked the Home Secretary whether his attention has been called to the dissatisfaction existing in certain areas, especially East Ham, concerning the policy of the coroner in employing for all post-mortem examinations one particular pathologist; whether he was aware that it had always been the practice hitherto, apart from exceptional criminal cases, for the general practitioner attending the case to be called upon either to perform the post-mortem examination or at least to be present when such was made; and whether he would take whatever action was necessary to ensure that general practitioners were not denied this valuable pathological experience.—Sir JOHN GILMOUR replied: The answer to the first part of the question is in the affirmative. Since the passing of the Coroners (Amendment) Act, 1926, it has been open to a coroner to request any legally qualified medical practitioner to make a post-mortem examination, and I have no power to interfere in any way with the discretion which is conferred on the coroner by statute.

Cattle Diseases

Mr. THOMAS WILLIAMS asked the Minister of Agriculture what action had been taken by his department and the Ministry of Health to implement the recommendations of the committee on cattle diseases; how many county authorities had appointed veterinary inspectors; and in what other direction efforts towards improvement had taken place.—Mr. ELLIOT replied: The report raises many issues involving large administrative questions, several of which are still being worked upon by the departments concerned. Two particular measures of importance affecting the matters concerned, of which I hope the facts will be far-reaching, have recently been or will shortly be brought into action—namely, the scheme of the Milk Marketing Board for a Roll of Accredited Producers which comes into operation on May 1st and the Government's Attested Herds Schemes which came into operation on Feb. 1st. In England and Wales county authorities have appointed 70 whole-time veterinary inspectors, and in addition 538 part-time. The majority of these were appointed for duties under the Diseases of Animals Acts; but they are available also for other duties if required. Twenty-one out of the 70 whole-time veterinary inspectors have been appointed since April 1st last.

Appointments

GUBBINS, R. C., M.B. Liverp., D.P.H., has been appointed Medical Officer of Health for Beaconsfield.

LEWIS, DENZIL, M.R.C.S. Eng., Hon. Anæsthetist to Queen Charlotte's Maternity Hospital, London.

RAVEN, R. W., F.R.C.S. Eng., Hon. Assistant Surgeon to the Gordon Hospital, London.

ROBERTS, N. W., M.B. Lond., F.R.C.S. Eng., Hon. Assistant Orthopædic Surgeon to the Liverpool Royal Infirmary.

SMYTH, M. J., M.Ch. N.U.I., F.R.C.S. Eng., Hon. Assistant Surgeon to the Gordon Hospital, London.

SUGGITT, S. C., M.B. Lond., F.R.C.S. Eng., Registrar to the Central London Throat, Nose, and Ear Hospital.

WOODRUFF, K. M., M.B. Lond., Hon. Anæsthetist to Queen Charlotte's Maternity Hospital, London.

Certifying Surgeons under the Factory and Workshop Acts: Dr. R. M. S. MCCONAGHEY (St. Blazey, Cornwall); Dr. M. TYTLER (Newark, Nottinghamshire).

Births, Marriages, and Deaths

BIRTHS

CREET.—On March 19th, at Ripley, Surrey, the wife of Ralli A. F. Creet, M.R.C.S. Eng., of a daughter.

HUBERT.—On March 16th, at Oakley-street, Chelsea, to Ruth, the wife of W. H. De Bargue Hubert, M.R.C.S. Eng., of a daughter.

HUMPHREYS.—On March 20th, at Princess Beatrice Hospital, S.W., the wife of G. Noel Humphreys, M.R.C.S. Eng., of a daughter.

LAMBRINUDI.—On March 19th, at Welbeck-street, the wife of C. Lambrinudi, F.R.C.S. Eng., of a son.

MONTEITH.—On March 17th, at Grantham, the wife of W. B. R. Monteith, F.R.C.S. Edin., of a daughter.

PRINGLE.—On March 22nd, at a nursing home, the wife of Peter Pringle, M.R.C.S. Eng., Uxbridge, of a son.

ROUTH.—On March 17th, at Okehampton, Devon, the wife of D. J. L. Routh, M.R.C.S. Eng., of a daughter.

SAMPSON.—On March 22nd, at Edgbaston, Birmingham, the wife of H. H. Sampson, F.R.C.S. Eng., of a daughter.

DEATHS

ENTRICAN.—On March 18th, at Beckley, Sussex, Lieut.-Colonel James Entrican, C.I.E., I.M.S. (retired), aged 70.

MOULD.—On March 18th, at Godwyn-gardens, Folkestone, Colonel William Thomas Mould, C.M.G., A.M.S. (retired), aged 69.

ODDIN-TAYLOR.—On March 15th, at Maritzburg, Natal, Gordon Oddin-Taylor, M.R.C.S. Eng., son of the late Francis Oddin-Taylor, of Thuxton, Norfolk.

ORTON.—On March 24th, suddenly, at Chailey, Sussex, William S. Orton, M.R.C.S. Eng.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

MEDICAL NEWS

University of London

At a meeting of the senate held on March 20th, Dr. John Gray was appointed reader in morbid anatomy at the British Postgraduate Medical School.

Dr. Gray was born in 1901, and was educated at George Heriot's School, Edinburgh, and at the University of Edinburgh where he won several scholarships and prizes. He graduated M.B., Ch.B. with honours in 1923, and in 1927 obtained a gold medal for his M.D. thesis on nephritis. After qualification he held a resident appointment at the Royal Infirmary, Edinburgh, and then joined the pathology department at Aberdeen University, remaining there as senior assistant and then as lecturer in morbid anatomy until 1934, when he became director of pathology and Lyle research scholar at Queen Mary's Hospital for the East End, Stratford. His research work has been chiefly concerned with nephritis, and he was the author of No. 178 of the Special Report Series published by the Medical Research Council entitled a Study of Nephritis and Allied Lesions.

The title of emeritus professor in surgery in the university is to be conferred on Mr. G. E. Gask on his retirement from the chair of surgery at St. Bartholomew's Hospital medical college at the end of the session.

Society of Apothecaries of London

At recent examinations the following candidates were successful :—

Surgery.—B. Anderson, Charing Cross Hosp.; S. M. Basu, Univ. of Durham; N. A. Bicchieri, St. George's Hosp.; and J. L. Wreddon, London Hosp.

Medicine.—W. C. Campbell, Univ. of Birmingham; O. A. L. Goode, Univ. of Leeds; and A. Ponder, Cambridge Univ. and Guy's Hosp.

Forensic Medicine.—S. M. Basu, Univ. of Durham; R. N. Crossley, Univ. of Manchester; N. H. E. de St. Dalmas, London Hosp.; and O. A. L. Goode, Univ. of Leeds.

Midwifery.—R. H. Bembridge, King's College Hosp.; S. E. Osborne, Guy's Hosp.; and H. V. Sansom, St. Bart.'s Hosp.

H. V. Sansom having completed the final examination is granted the diploma of the society entitling him to practise medicine, surgery, and midwifery.

University of Liverpool

At recent examinations the following candidates were successful.

D.M.R.E.

Part A.—F. O. Pilkington, R. G. Reid, E. Siung, and R. F. Wynroe.

D.P.H.

Part I.—A. R. Arulpragasam, A. T. Jones, E. Somasekhar, H. E. C. Sutton, and J. V. Walker.

D.T.M.

A. J. Board, Freda Harmer, A. Kamel, C. H. Li, J. R. Robertson, *H. R. Shone, S. L. Strange, J. W. C. Symonds, and A. J. Walker.

* Recommended for the Milne medal.

D.T.H.

S. O. Awoliyi, S. W. Cooper, P. C. Cosgrove, R. Y. Dunlop, K. C. Mackenzie, and Z. Z. Nyi.

National University of Ireland

At a meeting of the Senate held on March 21st, Dr Vernon O'Hea-Cussen was appointed lecturer of ophthalmology at University College, Cork.

The degree of M.D. was awarded to Prof. J. C. Saunders for published work.

The Richmond, Whitworth, and Hardwicke hospitals were recognised as teaching centres for ophthalmology and rhinology.

Prof. J. C. Saunders was appointed representative of the university at the congress of the Royal Institute of Public Health at Harrogate in June, and Prof. W. D. O'Kelly at the conference of the National Association for the Prevention of Tuberculosis at Southport in June.

Hughlings Jackson Centenary

On Thursday, April 4th, the section of neurology of the Royal Society of Medicine will hold a dinner at the Mayfair Hotel, London, W., at 6.45 for 7 P.M., to mark the centenary of Hughlings Jackson's birth. The dinner will be followed at 8.30 P.M. by an informal meeting at which Prof. Edwin Bramwell, Sir Farquhar Buzzard, Dr. Wilfred Harris, Dr. James Taylor, and Dr. S. A. K. Wilson, the president of the section, will speak. Dr. Macdonald Critchley, 137, Harley-street, is acting as secretary, and members who are unable to be present at the dinner may attend the meeting afterwards.

University of Dublin

At recent examinations at the School of Physic, Trinity College, the following candidates were successful :—

FINAL EXAMINATION FOR M.B., B.CH., B.A.O.

Medicine.—J. N. P. Moore, Maurice Marmelstein, Philip Citron, J. T. Wellwood, J. R. Shapiro, J. J. Talbot, and Leslie Fridjhon, and H. G. Ellerker (under old regulations).

Surgery.—D. S. Quill, Joseph Sorett, T. A. Cunningham, A. F. J. Delany, C. M. T. Adamson, D. J. Bradley, R. I. Shier, Charlotte F. Pike, and H. M. Glover.

Midwifery.—B. E. O'Brien (passed on high marks), J. A. Hamilton, G. J. Dixon, G. H. B. Roberts, A. F. H. Keatinge, H. J. Anderson, S. B. Sachs, Bethel Lapedus, J. C. Roux, D. J. Hayes, H. B. Sutton, F. T. P. Bergin, D. H. T. Duggan, N. G. Farrell, B. M. O'Sullivan, H. M. Glover, William Charney, and Emanuel Cowan.

DIPLOMA IN GYNÆCOLOGY AND OBSTETRICS

T. K. Ghosh and A. K. Acharya.

D.P.H.

Part I.—G. A. Miller, D. B. Bradshaw, J. K. Lavery, R. L. G. Proctor, T. J. O'Sullivan, and P. G. Daly.

Naval Medical Compassionate Fund

A meeting of the subscribers of this Fund will be held at 3 P.M. on Friday, April 26th, at the Medical Department of the Navy, Admiralty, S.W.1, to elect six directors of the Fund.

Royal Statistical Society

The council of this society are offering the Frances Wood memorial prize (value £30) in 1935. The prize is offered for the best investigation, on statistical lines, of any problem affecting the economic or social conditions of the people. Essays must be sent to the hon. secretaries of the society, 9, Adelphi-terrace, London, W.C. 2, not later than Oct. 31st, 1935.

Fellowships in Psychiatry

The Child Guidance Council offers two fellowships, each of £300, tenable for one year for half-time work at the London Child Guidance Clinic at Islington. Applications should be sent to the secretary of the council, Woburn-place, Upper Woburn-place, London, W.C. 1. Further particulars will be found in our advertisement columns.

Institute of Child Psychology

Speaking at the annual luncheon on March 31st, Dr. Margaret Lowenfeld, one of the directors, said that this institute is trying to work out a thesis that the child is an organic whole and that ill-health and many of the educational, antisocial and personal difficulties of the child arise from common factors. It hoped to make its results available for educational bodies, medical practitioners, and agencies for child welfare. During the year a wider range of medical complaints had been submitted, with good results. Mr. J. J. Mallon, warden of Toynbee Hall, declared that it was the capital sin of this generation that it had paid too little attention to the life of the child and to the mental aspect of that life. That phase would pass, because by degrees children were becoming scarcer. At the beginning of the century the number of children under the age of 15 was seven times as great as that of people over 65. Before very long the over-65's would predominate. There would be a new sense of the preciousness of children and a determination to enable every child to be as happy as it was meant to be. Much had been done in recent years to improve the child's physical condition, but the last figures showed that 68 per cent. of those who applied to join the army had been rejected on physical, educational, or other grounds, which indicated that there was nothing to brag about. "When you look at the problems now disquieting and alarming us," he said, "it is apparent that what is wrong with the race is not so much physical but mental failure. There is obviously room for improvement. The work of this institute may help to ameliorate many of the maladjustments of society." Dr. Ethel Dukes, co-director of the institute, appealed for help, saying that the work was being carried on under extremely difficult conditions, and that money was needed to secure adequate premises.

Prof. Winifred Cullis took the chair at the luncheon, and those present included the president, Lord Northbourne.

NOTES, COMMENTS, AND ABSTRACTS

ATYPICAL CANCER OF THE STOMACH

Two cases of gastric carcinoma in which the symptoms were ambiguous, are reported by W. H. Beekhuis and F. A. Schalij (Nederl. tijdschr. v. geneesk., 1935, lxxix, 763 and 949).

Beekhuis' patient, a man aged 65, had a year's history of epigastric pain, spreading through to the back. The pain had been almost continuous. There had been no nausea or vomiting, his appetite was good; he had lately grown a little thinner. Physical examination was negative. The fæces gave a positive benzidine reaction once, but not on two subsequent examinations. The test-meal showed a total acidity of 20, free HCl 1·8. Radiography revealed a carcinoma of the lesser curvature, of the "platter" type. Beckhuis points out that in other recorded cases of this kind the symptoms are rather those of ulcer than of cancer; that the differential diagnosis depends upon the characteristic radiographic appearances; and that the prognosis is relatively favourable, since metastases are late and radical operation offers a good chance of cure. In this case, the patient was well a year after operation.

In Schalij's case, the history extended over five years. The patient was a man aged 33, who during the whole of that time had suffered from more or less continuous pain in the epigastric and left hypochondriac regions, with acute exacerbations, especially after food. He had vomited rarely. The appetite was good, but he was afraid to eat much, because of the subsequent pain. There had been no loss of weight. On examination a mass could be felt in the left hypochondrium. Test-meal showed a total acidity of 10 with no free HCl. The fæces gave a positive reaction for blood once, but other examinations were negative. X ray examination revealed narrowing of the stomach, involving all but the two extremities of the organ. There was complete absence of contractions in the narrowed area. Emptying was abnormally rapid. At operation the entire stomach except the pyloric antrum and the uppermost part of the fundus was found to have been converted into a hard, tubular mass. Subtotal gastrectomy was performed, conserving a very small part of the fundus. Except for an attack of fatty diarrhœa soon after the operation recovery was uneventful. The invaded part of the stomach wall was found to contain a few scattered islets of carcinoma cells among abundant fibrous tissue. The mucosa appeared perfectly normal, with no sign of ulcer or cancer.

MEMORIAL TO DAVIDSON BLACK

THE *Chinese Medical Journal* of December, 1934, is a special number in memory of the late Prof. Davidson Black of Peiping Union Medical College, whose account of the discovery of *Sinanthropus pekinensis* is here reprinted from his Croonian lecture to the Royal Society in 1932. A portrait with facsimile signature is followed by a complete bibliography of his writings, which in the latter period of his life were concerned entirely with human palæontology.

A contribution by P'an Ming-Tzu on the coronary arteries of 40 Chinese adult hearts shows that accessory coronary arteries were found in more than half of the cases. The type of distribution on the diaphragmatic surface of the heart is characteristic and should be regarded as a definite racial pattern, though how early this pattern appears ontogenetically is an interesting subject for further study.

This special number also contains a plea for a continuation of coöperative embryological research in China, made by the Peiping (Pekin) Union Medical College. The first appeal, sent out 15 years ago, resulted in a generous response, upwards of 600 fœtuses, embryos and abnormal products of conception having been received by the College during the intervening period.

NEGATIVE EMBRYOTAXIS

Dr. R. L. Wason (Bath) writes: "In his account of the birth of the chimpanzee in your last issue (p. 678) Dr. Wyatt says that the mother retired from the young one as soon as it was born. This reminded me that I was once walking across a park where there were several sheep, one being in obvious discomfort. While I was watching she dropped a lamb and immediately got up and raced at full speed to the extremity of the park. It seemed an odd manifestation of maternal instinct. Probably, as in the case of the chimpanzee, it was her first."

THE SIZE OF THE HALIBUT

To the Editor of THE LANCET

SIR,—In reply to Flétan it is in our experience extremely rare to obtain a halibut weighing more than 300 lbs. In 1933 a fish weighing 40 stones (540 lbs.) was caught off the coast of Greenland. On the return journey the boat discharged its crew at a Norwegian port. The size of the fish was considered such a rarity that the mayor and civic officials came on board to view it. A few years ago a halibut was caught in the Pacific weighing over 700 lbs. We have no records of any fish exceeding this weight. With regard to the proportionate weight of the liver, this is approximately two per cent.

We are, Sir, yours faithfully,

J. F. WARD,

March 25th. Chief Chemist, British Colloids, Ltd.

A DISCLAIMER

Mr. P. R. ALLISON, surgical tutor, Leeds University, writes: It has been brought to my notice that in the *Daily Mirror* for Monday, March 25th, an account was given of a patient who collapsed under anæsthetic at Leeds Infirmary, and was subsequently revived by cardiac massage and artificial respiration. I find that my name has been associated with this operation, and I wish to state that this was entirely unauthorised. I have received a letter of apology from the Northern Editor of the *Daily Mirror*.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, April 2nd.

Medicine. 4 P.M. (Westminster Hospital, S.W.), Dr. David de Souza: 1. Recovery after Bilateral Amputation of Legs with Gangrene following Embolism. 2. Myelocytic Leukæmia with Retina Changes. Dr. Arnold Stott: 3. Calcification of the Pericardium. 4. Coarctation of the Aorta without Evidence of Collateral Circulation. Dr. W. E. Lloyd: 5. Massive Collapse of the Lung following Hæmoptysis due to Tuberculosis. 6. Bilateral Sweating of the Face. 7. Basophil Adenoma of the Pituitary Gland. Mr. Rock Carling: 8. Results of Sympathectomy in Abnormal Vascular Conditions. Cases will also be shown by Sir Stanley Woodwark, Dr. Donald Paterson, and Dr. R. C. Lightwood.

Orthopædics. 5.30 P.M. (Cases at 4.30 P.M.) Mr. J. P. Hosford: 1. Synovectomy for Multiple Synovial Chondromata. Mr. S. A. S. Malkin: 2. Radiographs of Congenital Fusion of Dorsal Vertebræ. 3. Radiographs of Ununited Fracture of the Tibia with Overgrowth of Fibula. Cases will also be shown by Mr. W. Eldon Tucker.

WEDNESDAY, April 3rd.

History of Medicine. 5 P.M. Dr. Tom Hare: An Eighteenth Century Apothecary's Pressed-horn Snuff-box. Prof. A. S. Yahuda: Medical References in the Books of Moses as illustrated by Egyptian Papyri. A discussion will follow in which Sir Grafton Elliot-Smith and Mr. Warren R. Dawson will take part.

Surgery. 8.30 P.M. Discussion on Traumatic Shock to be opened by Mr. R. L. Holt, Dr. David Slome, and Sir Henry Dale.

THURSDAY, April 4th.
Neurology. 6.45 P.M. for 7 P.M. A dinner meeting at the Mayfair Hotel to mark the centenary of Hughlings Jackson's birth. Speakers: Prof. E. Bramwell, Sir Farquhar Buzzard, Dr. Wilfred Harris, Dr. James Taylor, and Dr. S. A. Kinnier Wilson.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.
FRIDAY, April 5th.—8.30 P.M. (De Vere Hotel, Kensington) Dr. J. W. McNee: Jaundice.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, April 1st, to SATURDAY, April 6th.—INFANTS HOSPITAL, Vincent-square, S.W. Afternoon course in infants' diseases.—ROYAL EYE HOSPITAL, St. George's-circus, S.E. Afternoon course in ophthalmology.—WEST END HOSPITAL FOR NERVOUS DISEASES, Gloucester Gate, Regent's Park. TUES., 8.30 P.M., Mr. Lindsay Rea: Fundus Oculi.—Courses, &c., are open only to members and associates of the Fellowship.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
MONDAY, April 1st.—Noon, Dr. W. W. Payne: Diabetes. 4. Complications.
WEDNESDAY.—2 P.M., Dr. D. Bateman: Gastro-intestinal Infection in Children.
THURSDAY.—Noon, Dr. A. Signy: Vulvo vaginitis.
FRIDAY.—Noon, Mr. A. Simpson-Smith: Acute Appendicitis in Children.
Out-patient clinics daily at 10 A.M. and ward visits (except on Wednesday) at 2 P.M.

CANCER HOSPITAL (FREE), Fulham-road, S.W.3.
THURSDAY, April 4th.—4 P.M., Mr. C. Dee Shapland: Ophthalmological Examination in the Diagnosis of Malignant Disease.

BRITISH RED CROSS SOCIETY'S CLINIC FOR RHEUMATISM, Peto-place, N.W.
THURSDAY, April 4th.—8.30 P.M., Mr. A. E. Mortimer Woolf: Some Surgical Conditions Mistaken for Rheumatism.

LONDON HOMŒOPATHIC HOSPITAL, Great Ormond-street, W.C.
THURSDAY, April 4th.—4 P.M., Dr. T. G. Ross: Homœopathic Treatment in Septic Conditions.

ANCOATS HOSPITAL, Manchester.
THURSDAY, April 4th.—4.15 P.M., Dr. R. Ellis: Pleural Effusions and Associated Lung Lesions.

ROYAL INFIRMARY, Manchester.
TUESDAY, April 2nd.—4.15 P.M., Dr. D. Dougal: Ectopic Pregnancy.
FRIDAY.—4.15 P.M., Dr. E. B. Leech: Demonstration of Medical Cases.

PUBLIC DISPENSARY, Leeds.
WEDNESDAY, April 3rd.—4 P.M., Mr. L. N. Pyrah: Some Symptoms of Urological Disease.

GENERAL INFIRMARY, Leeds.
TUESDAY, April 2nd.—3.30 P.M., Dr. Vining: The Nervous Disorders of Childhood with Special Reference to Conditions of Abnormal Behaviour.

UNIVERSITY OF BIRMINGHAM.
TUESDAY, April 2nd.—3.30 P.M. (General Hospital), Mr. Musgrave Woodman: The Common Ear and Throat Emergencies in Practice.
FRIDAY.—3.30 P.M. (Queen's Hospital), Mr. J. N. Sankey: Diseases of the Rectum.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, April 3rd.—4.15 P.M. (Royal Samaritan Hospital), Dr. John Hewitt: Gynæcological Cases.

Vacancies

For further information refer to the advertisement columns

Ashton-under-Lyne, District Infirmary.—Two H.S.'s. Each at rate of £150.
Bath, Bailbrook House.—Res. M.O.
Birkenhead General Hospital.—Hon. Asst. Physician.
Birmingham General Hospital.—Res. Surg. Reg. £100–20–140.
Birmingham, Selly Oak Hospital.—Jun. M.O. At rate of £200.
Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £120.
Burnley, Victoria Hospital.—H.S. and H.P. Each at rate of £150.
Cambridge, Addenbrooke's Hospital.—Res. Anæsthetist and Emergency O. Also H.S. to Spec. Depts. Each at rate of £130.
Cancer Hospital, Fulham-road, S.W.—Second Asst. Path. £250.
Child Guidance Council, Woburn-place, W.C.—Two Fellowships in Psychiatry. Each £300.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
Colindale Hospital, Hendon, N.W.—Asst. M.O. £350.
Coventry and Warwickshire Hospital.—Res. Cas. O. £125.
Derbyshire C.C.—Asst. Maternity and Child Welfare M.O. £600.
Derbyshire Royal Infirmary.—Cas. O. and Orthopædic H.S. £150.
Dewsbury and District General Infirmary.—Sen. H.S. £200.
Doncaster Royal Infirmary.—H.S. to Ear, Nose, and Throat Depts. Cas. H.S. Also H.S. Each at rate of £175.
Dover Royal Victoria Hospital.—Res. M.O. £180.
Ealing, King Edward Memorial Hospital.—Jun. Res. M.O. At rate of £150.
East Ham Memorial Hospital, Shrewsbury-road, E.—Anæsthetist. 1 gn. per session.
Edinburgh City.—Depute M.O.H. £900.
Exeter, Royal Devon and Exeter Hospital.—H.S. At rate of £150.
Harrogate, Royal Bath Hospital.—Res. M.O. At rate of £156.
Home Office, Children's Branch.—Asst. Med. Inspector. £515.
Hospital for Consumption, &c., Brompton, S.W.—Res. M.O. £350. Two Med. Regs., Res. Surg. O., Assist. Res. M.O. Each at rate of £150. Three H.P.'s. Also H.P. for Frimley Sanatorium. Each £50.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. and H.P. At rate of £150 and £100 respectively. Also Hon. Asst. Physician.
Ilford, King George Hospital.—Cas. O. At rate of £150.
Kettering and District General Hospital, —Res. M.O. At rate of £200.
Leamington Spa, Warneford General Hospital.—Res. H.P. At rate of £150.
Liphook, Hants, King George's Sanatorium.—Asst. M.O. At rate of £200.
Liverpool and District Hospital for Diseases of the Heart.—H.P. At rate of £100.
Liverpool City Bacteriologist's Dept.,—Two Temporary Jun. Asst. Bacteriologists. Each at rate of £400.
Liverpool, Royal Children's Hospital, Myrtle-street.—Hon. Med. Psychologist.
Llanelly and District Hospital.—H.S. £150.
London Lock Hospital and Home, 283, Harrow-road, W.—Anæsthetist.
Lowestoft, St. Luke's Hospital.—Sen. Asst. M.O. £500.
Manchester, Ancoats Hospital.—Res. M.O. At rate of £150.
Manchester, Booth Hall Hospital.—Jun. Asst. M.O. At rate of £200.
Manchester, Christie Hospital and Holt Radium Institute.—Asst. Radiological O. At rate of £500.
Manchester Royal Infirmary and University of Manchester.—Travelling Research Scholarship in Medicine. £300. Also for Pathology Scholarship. £75.
Margate, Royal Sea Bathing Hospital.—H.S. At rate of £200.
Metropolitan Hospital, Kingsland-road, E.—Sen. H.P. and H.S. Jun. H.P. and H.S. Also Cas. O. Each at rate of £100.
Middlesbrough, North Riding Infirmary.—2nd H.S. At rate of £150.
National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. Also Out-Patient M.O. At rate of £150 and £125 respectively.
National Hospital, Queen-square, W.C.—Res. M.O. £200.
Newark General Hospital.—Res. H.S. £175.
Northwood, Mount Vernon Hospital.—Asst. Radiologist. Also H.S. At rate of £150.
Nottingham and Midland Eye Infirmary.—Res. H.S. £200.
Nottingham General Hospital.—H.P. At rate of £150.
Paddington Green Children's Hospital, W.—H.P. and H.S. Each at rate of £150.
Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.—H.P. At rate of £100. Also Clin. Asst. for Out-patient Dept.
Reading, Royal Berkshire Hospital.—H.P., H.S., H.S. for Ophth., Ear, Nose, and Throat Dept. Also Cas. O. Each at rate of £125.
Royal Masonic Hospital, Ravenscourt Park, W.—Res. Surg. O. At rate of £250.
Royal Northern Hospital, Holloway-road, N.—Radiologist. Also Asst. Radiologist. £580 and £410 respectively.
Royal Society of Medicine, Wimpole-street, W.—William Gibson Research Scholarship for Medical Women. £292.
St. John's Hospital, Lewisham, S.E.—Res. M.O. £200. Also Two Res. H.P.'s and Cas. O.'s. Each at rate of £100.
St. Mary's Hospital, W.—Med. Reg. £200.
St. Paul's Hospital, Endell-street, W.C.—H.S. At rate of £150.
Sheffield, Jessop Hospital for Women.—Res. M.O. At rate of £150. Also H.S. and Res. Anæsthetist. At rate of £100.
Sheffield Royal Infirmary.—Res. M.O. At rate of £80.
Southampton Isolation Hospital and Sanatorium.—Jun. Res. M.O. £200.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. for Aural and Ophth. Dept. At rate of £150.
Violet Melchett Infant Welfare Centre, Wellington-street, S.W.—Asst. M.O. At rate of £100.
Walthamstow, Infectious Disease Hospital.—Res. M.O. 1 gn. a day.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. Res. H.S.'s. £150 and £100 respectively.
West Riding of Yorkshire.—Sen. Administrative Asst. to County M.O. £1000.
West Riding of Yorkshire County Council.—School Med. Inspector. £500.
Willesden General Hospital, Harlesden-road, N.W.—Hon. Anæsthetist. Also Hon. Physio-therapeutist.
Wokingham, Berks, Pinewood Sanatorium.—Sen. Asst. M.O. £500.

ROYAL FREE HOSPITAL.—Sir Arnold Wilson stated at the annual court of the governors that this hospital has raised £20,000 a year from patients. This made it possible to give the poorest the best treatment that London could afford, and assured the benevolent public that money was not wasted on the treatment of those who could afford to pay for it. Last year the hospital treated 1730 in-patients and 14,794 out-patients.